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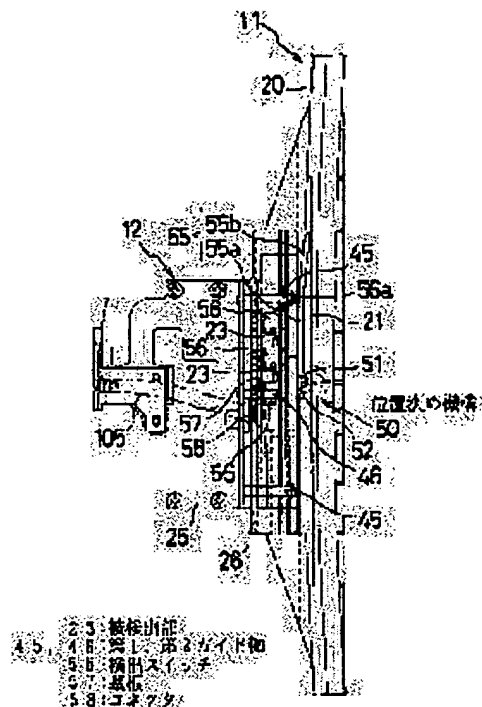
(72)Inventor : SHOJI YOSHIHISA

(54) EMBROIDERY FRAME TRANSFERRING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an embroidery frame transferring device wherein the attaching/detaching of an embroidery frame to/from a carriage is smoothly performed, durability is improved by preventing a detecting switch from deteriorating, and the embroidery frame which is fitted on the carriage can be easily and surely detected without a wrong detection.

SOLUTION: A lock mechanism 40 of this embroidery frame transferring device 10 has a lock member 41 and a compression coil spring 42. In this case, the lock member 41 is supported by the carriage 12 in a manner to be movable between a pressing location wherein the connecting section 21 of the embroidery frame 11 is pressed to the carriage 12, and a releasing location wherein the pressing is released. The compression coil spring 42 urges the lock member 41 to the pressing location. A section 23 to be detected is provided on the connecting section 21 of the embroidery frame 11, and a detecting switch 56 which detects the section 23 to be detected is provided on the lock member 41. Then, the embroidery frame-transferring device is constituted in such a manner that only under a state wherein the lock member 41 is switched to the pressing location, the detecting switch 56 can detect the section 23 to be detected.



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CLAIMS

[Claim(s)]

[Claim 1] An embroidery frame It is removable carriage about an embroidery frame. A transport station which moves carriage to a rectangular 2-way independently an embroidery frame concrete supply system equipped with the above -- it is -- said carriage -- a detection location and an evacuation location -- continuing -- a location -- switchable moving-part material is prepared, a pilot switch for detecting a detecting element-ed of an embroidery frame to this moving-part material is prepared, and it is characterized by constituting from a pilot switch possible [detection of a detecting element-ed] in the condition of having switched said moving-part material to a detection location.

[Claim 2] An embroidery frame A transport station which moves removable carriage and carriage for an embroidery frame to a rectangular 2-way independently An engagement device in which are the embroidery frame concrete supply system equipped with the above, and the connection section of an embroidery frame is made to engage with said carriage possible [engaging and releasing], A lock device which locks on carriage the connection section of an embroidery frame which engaged with a frame stowed position through this engagement device possible [discharge] is established. This lock device Moving-part material which covered a press location which presses said connection section on carriage, and a discharge location which cancels press, and was supported by carriage free [migration], While having an energization member which energizes this moving-part material to a press location and preparing a detecting element-ed in the connection section of said embroidery frame, a pilot switch which detects a detecting element-ed is prepared in moving-part material. It is characterized by constituting from a pilot switch possible [detection of a detecting element-ed of an embroidery frame] in the condition of having switched said moving-part material to a press location.

[Claim 3] It is the embroidery frame concrete supply system according to claim 1 or 2 characterized by consisting of a height in which said pilot switch is an on-off switch which has a detection lever which can contact a detecting element-ed, and said detecting element-ed projects to a detection lever side.

[Claim 4] Said engagement device is an embroidery frame concrete supply system according to claim 2 characterized by having the engagement section engaged it is prepared in an engagement slot and another side which were established in one side of the connection section of carriage and an embroidery frame, and possible [a slide into said engagement slot].

[Claim 5] An embroidery frame concrete supply system according to claim 4 characterized by having put in order and prepared two or more pilot switches in the embroidery frame wearing direction at said carriage, having prepared 1, 1 corresponding to two or more pilot switches, or two or more detecting elements-ed in the connection section of an embroidery frame, and having arranged these 1 or two or more detecting elements-ed by arrangement pattern of a proper for every class of embroidery frame.

[Claim 6] An embroidery frame concrete supply system according to claim 5 characterized by preparing one detecting element-ed corresponding to a pilot switch located in the upstream in the case of penetration at the time of embroidery frame wearing in an embroidery frame with high operating frequency.

[Claim 7] An embroidery frame concrete supply system given in any of claims 3-6 characterized by lobe prepared in said moving-part material, and having been prepared in an embroidery frame and establishing a positioning device in which have a concave which a lobe can engage and release, a lobe engages with a concave, and an embroidery frame is positioned to said frame stowed position they are.

[Claim 8] An embroidery frame concrete supply system given in any of claims 3-7 characterized by preparing the guide section which guides moving-part material and is switched to an evacuation location or a discharge location in the connection section or moving-part material of an embroidery frame when equipping a frame stowed position of carriage with an embroidery frame through said engagement device they are.

[Claim 9] An embroidery frame concrete supply system according to claim 4 characterized by forming a substrate which

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connects two or more pilot switches to said moving-part material electrically.

[Claim 10] An embroidery frame concrete supply system according to claim 9 by which it is preparing-in said substrate-connector which connects wiring of substrate to control unit of said embroidery frame concrete supply system electrically characterized.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] About an embroidery frame concrete supply system, especially this invention covers a detection location (press location) and an evacuation location (discharge location), prepares a pilot switch in the moving-part material in which a location change is possible, and relates to the embroidery frame concrete supply system which consisted of pilot switches possible [detection of the detecting element-ed of an embroidery frame] in the condition of having switched moving-part material to the detection location.

[0002]

[Description of the Prior Art] Conventionally, the common embroidery frame concrete supply system is equipped with the embroidery frame, the direction transport station of Y which moves removable carriage and carriage crosswise [of the sewing-machine base section] (the direction of Y) for an embroidery frame, the direction transport station of X which moves carriage in the length direction (the direction of X) of the sewing-machine base section with this direction transport station of Y. The embroidery frame which attached the processing cloth with this embroidery frame concrete supply system is transported in the direction of X, and the direction of Y, sewing is given to that processing cloth according to the sewing device of a sewing machine, and an embroidery pattern is formed.

[0003] The direction frame of Y to which the direction transport station of Y enables guide support of the migration of carriage in the direction of Y, It has the direction drive system containing the direction motor of Y with which this direction frame of Y is equipped and which drives carriage in the direction of Y of Y. The direction transport station of X It has the direction drive system of X containing the direction motor of X with which the direction frame of X which is prepared in the direction frame bottom of Y, and enables guide support of the migration of the direction frame of Y in the direction of X, and this direction frame of X are equipped and which drives the direction frame of Y in the direction of X.

[0004] There is much what held the direction transport station of X in the case member, arranged the direction transport station of Y and carriage in the case member bottom, and constituted this case member from this kind of an embroidery frame concrete supply system removable in the sewing-machine base section. If the sewing-machine base section is equipped with a case member, the electric system of an embroidery frame concrete supply system and the electric system of a sewing machine will be connected through a connector, and drive control of the direction transport station of X and the direction transport station of Y will be carried out by the control section of a sewing machine.

[0005] By the way, practical use is presented with what prepared the pilot switch for mainly detecting the existence of wearing of an embroidery frame in the conventional embroidery frame concrete supply system. For example, if a pilot switch is prepared in said direction frame of Y, or a case member fixed, drive control of the transport station is carried out, carriage is moved to a predetermined detection location (for example, near a motion limit community location) and carriage is then equipped with the embroidery frame, the technology with which the detecting element-ed of an embroidery frame was detected by the pilot switch is known.

[0006] Moreover, if a pilot switch is prepared in carriage fixed and the frame stowed position of carriage is equipped with an embroidery frame, the technology with which the detecting element-ed of an embroidery frame was detected by the pilot switch is also known. in this technology, it is the existence of wearing of an embroidery frame -- while preparing two or more pilot switches in the carriage instead of **, the class of embroidery frame is also detectable with the arrangement pattern of a detecting element-ed [these] by preparing 1, 1 corresponding to two or more pilot switches, or two or more detecting elements-ed in an embroidery frame.

[0007] On the other hand, in the conventional embroidery frame concrete supply system, various structures which detach and attach an embroidery frame on carriage are put in practical use. For example, in the utility model registration

No. 2522857 official report for which the applicant for this patent applied, one pair of longwise engagement slots are formed in the standing wall section of carriage from upper limit, and one pair of engagement pins corresponding to one pair of engagement slots are prepared in the connection section of an embroidery frame, and the flat spring which energizes said connection section below in the energization location jutted out of the standing wall section bottom to the embroidery frame side is prepared in carriage.

[0008]

[Problem(s) to be Solved by the Invention] In the conventional embroidery frame concrete supply system, if carriage is moved to a detection location and carriage is then equipped with the embroidery frame, only in order to mainly detect the existence of wearing of an embroidery frame, with the technology in which the detecting element-ed of an embroidery frame is detected by the pilot switch, carriage must be moved to a detection location. And in order to detect the existence of wearing of an embroidery frame certainly before performing embroidery sewing and to have to move carriage to a detection location for every sewing initiation, the time amount and power for it are built and it is quite disadvantageous.

[0009] moreover, if a pilot switch is prepared in carriage fixed and the frame stowed position of carriage is equipped with an embroidery frame, with the technology in which the detecting element-ed of an embroidery frame is detected by the pilot switch Since the pilot switch is located in the location which can always detect the detecting element-ed of an embroidery frame, Whenever especially a pilot switch detaches and attaches an embroidery frame on carriage in the case of a contact mold switch etc., portions other than the detecting element-ed of the embroidery frame with which the pilot switch corresponds are contacted, and fear, like that an embroidery frame cannot be detached and attached smoothly and a pilot switch deteriorates and endurance falls arises.

[0010] And even if the frame stowed position of carriage is not completely equipped with the embroidery frame, there is a possibility that a pilot switch may detect the detecting element-ed of an embroidery frame. That is, even if wearing to the frame stowed position of an embroidery frame is deficient, if equipped with the embroidery frame, it will incorrect-detect, and if sewing is performed in this condition, a backlash will arise in an embroidery frame and the quality of an embroidery pattern will deteriorate.

[0011] Moreover, in the embroidery frame concrete supply system of the utility model registration No. 2522857 official report, there is also a problem that the quality of a lifting and an embroidery pattern deteriorates [an embroidery frame] a backlash ***** location gap to carriage according to a manufacture error, an assembly error, etc. in case it is difficult to make one pair of engagement pins of an embroidery frame engage with one pair of engagement slots on the carriage without a backlash and especially an embroidery frame starts migration. So, although high process tolerance and assembly precision are needed, un-arranging -- manufacture cost becomes expensive -- arises.

[0012] The purposes of this invention are detaching and attaching an embroidery frame smoothly, preventing deterioration of a pilot switch and raising endurance, detecting simply and certainly, without incorrect-detecting the embroidery frame with which carriage's is equipped, etc. in an embroidery frame concrete supply system.

[0013]

[Means for Solving the Problem] In an embroidery frame concrete supply system with which an embroidery frame concrete supply system of claim 1 was equipped with a transport station which moves removable carriage and carriage for an embroidery frame and an embroidery frame to a rectangular 2-way independently Switchable moving-part material is prepared. said carriage -- a detection location and an evacuation location -- continuing -- a location -- A pilot switch for detecting a detecting element-ed of an embroidery frame is prepared in this moving-part material, and it is characterized by constituting from a pilot switch possible [detection of a detecting element-ed] in the condition of having switched said moving-part material to a detection location.

[0014] This embroidery frame concrete supply system is equipped with an embroidery frame, carriage, and a transport station, carriage is equipped with an embroidery frame, that carriage is independently moved to a rectangular 2-way, sewing is given to a processing cloth attached in that carriage according to a sewing device of a sewing machine, and an embroidery pattern is formed. carriage -- a detection location and an evacuation location -- continuing -- a location -- switchable moving-part material is prepared, a pilot switch for detecting a detecting element-ed of an embroidery frame to this moving-part material is prepared, and it consists of pilot switches possible [detection of a detecting element-ed] in the condition of having switched moving-part material to a detection location.

[0015] That is, it can change into a condition which cannot detect a detecting element-ed of an embroidery frame by pilot switch, and an embroidery frame can be detached and attached on carriage, moving-part material is switched to an evacuation location, where a frame stowed position is equipped with an embroidery frame, moving-part material can be switched to a detection location, and a detecting element-ed of an embroidery frame can be detected by pilot switch.

When especially a pilot switch is a contact mold switch, in case it is attachment and detachment of an embroidery

frame, as the pilot switch can hardly contact a detecting element-ed and the other portion of an embroidery frame, it can detach and attach an embroidery frame smoothly, it can prevent deterioration of a pilot switch, and can raise endurance. [0016] Thus, a detecting element-ed of an embroidery frame is easily detectable only by equipping carriage with an embroidery frame, and if moving-part material is held in an evacuation location in the case of attachment and detachment of an embroidery frame and a frame stowed position is equipped with an embroidery frame, it can detect certainly with constituting moving-part material possible [a change in a detection location], without incorrect-detecting a detecting element-ed of an embroidery frame with which carriage is equipped. In addition, about moving-part material, you may prepare as a member only for preparing a pilot switch, and when the connection section of an embroidery frame is pressed possible [discharge] on carriage and it locks it on it, you may prepare as the lock member and a common member.

[0017] In an embroidery frame concrete supply system with which an embroidery frame concrete supply system of claim 2 was equipped with an embroidery frame and a transport station which moves removable carriage and carriage for an embroidery frame to a rectangular 2-way independently An engagement device in which the connection section of an embroidery frame is made to engage with said carriage possible [engaging and releasing], A lock device which locks on carriage the connection section of an embroidery frame which engaged with a frame stowed position through this engagement device possible [discharge] is established. This lock device Moving-part material which covered a press location which presses said connection section on carriage, and a discharge location which cancels press, and was supported by carriage free [migration], While having an energization member which energizes this moving-part material to a press location and preparing a detecting element-ed in the connection section of said embroidery frame, a pilot switch which detects a detecting element-ed is prepared in moving-part material. It is characterized by constituting from a pilot switch possible [detection of a detecting element-ed of an embroidery frame] in the condition of having switched said moving-part material to a press location.

[0018] This embroidery frame concrete supply system is equipped with an embroidery frame, carriage, and a transport station, carriage is equipped with an embroidery frame, that carriage is independently moved to a rectangular 2-way, sewing is given to a processing cloth attached in that carriage according to a sewing device of a sewing machine, and an embroidery pattern is formed. An engagement device and a lock device are established, according to an engagement device, the connection section of an embroidery frame is made to engage with carriage possible [engaging and releasing], and the connection section of an embroidery frame which engaged with a frame stowed position through this engagement device according to a lock device is locked possible [discharge] on carriage.

[0019] A lock device has moving-part material and an energization member, moving-part material covers a press location which presses said connection section on carriage, and a discharge location which cancels press, and is supported by carriage free [migration], and this moving-part material is energized by energization member in a press location. And a detecting element-ed is prepared in the connection section of an embroidery frame, a pilot switch which detects a detecting element-ed to moving-part material is prepared, and it consists of pilot switches possible [detection of a detecting element-ed of an embroidery frame] in the condition of having switched moving-part material to a press location.

[0020] That is, moving-part material is switched to a discharge location, it changes into a condition which cannot detect a detecting element-ed of an embroidery frame by pilot switch, and an embroidery frame can be detached and attached on carriage, and while pressing said connection section on carriage according to energization force of an energization member and locking, a detecting element-ed of an embroidery frame is detectable [moving-part material switches to a press location in the condition of having made the connection section of an embroidery frame engaging with a frame stowed position, and] by pilot switch. When especially a pilot switch is a contact mold switch, in case it is attachment and detachment of an embroidery frame, as the pilot switch can hardly contact a detecting element-ed and the other portion of an embroidery frame, it can detach and attach an embroidery frame smoothly, it can prevent deterioration of a pilot switch, and can raise endurance.

[0021] Thus, a detecting element-ed of an embroidery frame is easily detectable only by equipping carriage with an embroidery frame, and if moving-part material is held in a discharge location in the case of attachment and detachment of an embroidery frame and a frame stowed position is equipped with an embroidery frame, it can detect certainly with constituting moving-part material possible [a change in a press location], without incorrect-detecting a detecting element-ed of an embroidery frame with which carriage is equipped. Moreover, since said connection section is pressed on carriage by moving-part material and it was made to equip, neither so high process tolerance nor assembly precision is needed, but it can prevent that manufacture cost becomes expensive.

[0022] An embroidery frame concrete supply system of claim 3 is an on-off switch which has a detection lever to which said pilot switch can contact a detecting element-ed in claim 1 or invention of 2, and said detecting element-ed is

characterized by consisting of a height which projects to a detection lever side. If moving-part material is switched to a detection location (press location) where a frame stowed position is equipped with an embroidery frame, since a rocking lever of a pilot switch will contact and rock to a height of an embroidery frame, a detecting element-ed of an embroidery frame is certainly detectable by pilot switch.

[0023] In invention of claim 2, said engagement device is prepared in an engagement slot and another side which were established in one side of the connection section of carriage and an embroidery frame, and an embroidery frame concrete supply system of claim 4 is characterized by having the engagement section which engages with said engagement slot possible [a slide]. It can catch into a portion which forms an engagement slot or the engagement section of carriage, the section can be prepared, and said connection section engaged through this engagement device can be pressed by lock member in said receptacle section. Since the connection section of an embroidery frame can be made to slide between carriage and a lock member, in case it is attachment and detachment of an embroidery frame, it is not necessary to evacuate a lock member to a discharge location greatly, and overall structure can be miniaturized and simplified.

[0024] In invention of claim 4, an embroidery frame concrete supply system of claim 5 puts in order and prepares two or more pilot switches in the embroidery frame wearing direction at said carriage, prepares 1, 1 corresponding to two or more pilot switches, or two or more detecting elements-ed in the connection section of an embroidery frame, and is characterized by having arranged these 1 or two or more detecting elements-ed by arrangement pattern of a proper for every class of embroidery frame. That is, a class of embroidery frame with which carriage was equipped can be detected now. And in case it equips making an embroidery frame slide through said engagement device, it can constitute so that a pilot switch may hardly contact a detecting element-ed of an embroidery frame.

[0025] An embroidery frame concrete supply system of claim 6 is characterized by preparing one detecting element-ed corresponding to a pilot switch located in the upstream at an embroidery frame with high operating frequency in the case of penetration at the time of embroidery frame wearing in invention of claim 5. In case an embroidery frame with high operating frequency is detached and attached on carriage, in order for the remaining pilot switches other than a pilot switch located in the upstream in the case of penetration at the time of embroidery frame wearing to completely contact said detecting element-ed, deterioration of said remaining pilot switch can be prevented more certainly, and endurance can be raised.

[0026] An embroidery frame concrete supply system of claim 7 is characterized by lobe prepared in said moving-part material, and having been prepared in an embroidery frame and establishing a positioning device in which have a concave which a lobe can engage and release, a lobe engages with a concave, and an embroidery frame is positioned to said frame stowed position in invention [which / of claims 3-6]. In order to detect a detecting element-ed certainly by pilot switch, where it made a lobe engage with a concave and an embroidery frame is positioned to a frame stowed position, moving-part material can be switched to a detection location (press location).

[0027] In invention [which / of claims 3-7], in case an embroidery frame concrete supply system of claim 8 equips a frame stowed position of carriage with an embroidery frame through said engagement device, it is characterized by preparing the guide section which guides moving-part material and is switched to an evacuation location or a discharge location in the connection section or moving-part material of an embroidery frame. In case an embroidery frame detaches and attaches an embroidery frame in the condition of being located in addition to a frame stowed position, moving-part material can be certainly held in an evacuation location or a discharge location.

[0028] An embroidery frame concrete supply system of claim 9 is characterized by forming a substrate which connects two or more pilot switches to said moving-part material electrically in invention of claim 4. Two or more wiring corresponding to two or more pilot switches is packed through a substrate formed in moving-part material, and it can connect now with a control unit of an embroidery frame concrete supply system etc.

[0029] In invention of claim 9, it is preparing-in said substrate-connector which connects wiring of substrate to control unit of said embroidery frame concrete supply system electrically characterized by embroidery frame concrete supply system of claim 10. Connection and separation to a control unit of an embroidery frame concrete supply system of wiring of a substrate can be performed easily, and it becomes convenient at the times, such as an assembly of an embroidery frame concrete supply system, and a maintenance.

[0030]

[Embodiment of the Invention] Hereafter, it explains, referring to a drawing about the gestalt of operation of this invention. This operation gestalt is an example at the time of applying this invention to the embroidery frame concrete supply system which transports the embroidery frame furnished with a processing cloth, in order to give sewing to a processing cloth by the sewing machine and to form an embroidery pattern. In addition, front and rear, right and left of drawing 1 is explained as front and rear, right and left.

[0031] A sewing machine M is explained briefly first. As shown in drawing 1 , a sewing machine M has the base section 1, the pedestal section 2, the arm section 3, and the head section 4, and the base section 1 is equipped with the embroidery frame concrete supply system 10 removable. A needle bar 5 and a pressure bar 7 are supported possible [vertical movement], the lower limit section of a needle bar 5 is equipped with a sewing needle 6, and the head section 4 is equipped with the cloth presser foot 8 for embroidery at the lower limit section of a pressure bar 7. The thread prehension machine (illustration abbreviation) which consists of a rotation iron pot is formed in the interior of the base section 1, this thread prehension machine and sewing needle 6 collaborate, the confounding of a needle thread and the bobbin thread is carried out, and a blind stitch is formed in a processing cloth.

[0032] Although not illustrated, the balance drive which drives a sewing-machine motor, the needle-bar drive which drives a needle bar 5, a balance, and a balance, the iron pot drive which drives a rotation iron pot are formed in the sewing machine M. These drives are constituted so that the driving force of for example, a sewing-machine motor may be transmitted to a needle bar 5, a balance, and a rotation iron pot, respectively and they may be driven.

[0033] The embroidery frame concrete supply system 10 is explained. As shown in drawing 1 - drawing 8 , the embroidery frame concrete supply system 10 has the direction transport station 14 of X which the connection section 21 of an embroidery frame 11 and an embroidery frame 11 is arranged [transport station] in the direction transport station [of Y] 13, and direction transport station 13 bottom of Y which makes it move to the cross direction (the direction of Y) which is the cross direction of the base section 1 in the removable carriage 12 and carriage 12, and moves carriage 12 to the longitudinal direction (the direction of X) which is the length direction of the base section 1 with the direction transport station 13 of Y.

[0034] The embroidery frame concrete supply system 10 has the case 15 where it has the smooth upper surface, and the movable case 16 which it is arranged in this case 15 bottom, and the amount of order both ends jut out over a cross direction to case 15 order both sides long and slender.

[0035] A case 15 consists of top case 15a and bottom case 15b (refer to drawing 2 - drawing 7), the direction transport station 14 of X is held in this case 15, and most and carriage 12 of the direction transport station 13 of Y are arranged in the case 15 bottom. Rather than the front end portion, a back end portion is constituted so that it may **** greatly from a case 15, and as for the movable case 16, a part of direction transport station 13 of Y and carriage 12 are held in the movable case 16. The base section 1 is equipped with a case 15, and the upper surface of a case 15 becomes the same height as the upper surface (base side) of the base section 1 in this condition.

[0036] As shown in drawing 2 , drawing 9 - drawing 11 , an embroidery frame 11 has the cloth attachment frame part 20 which attaches a processing cloth, and the connection section 21 connected with carriage 12, and the embroidery frame 11 which is two or more kinds from which the magnitude and the configuration of the cloth attachment frame part 20 differ is formed in this embroidery frame concrete supply system 10 removable. However, the same sign is attached and explained about these embroidery frames 11. For example, for the cloth attachment frame part 20, as for the embroidery frame 11 of about 160x260 (longitudinal-direction length [mm] x cross-direction length [mm]), and drawing 10 , the cloth attachment frame part 20 is [drawing 2 and drawing 9 / the cloth attachment frame part 20 of the embroidery frame 11 of about 100x100 and drawing 11] the embroidery frame 11 of about 60x40.

[0037] the connection section 21 of two or more kinds of embroidery frames 11 -- abbreviation -- it is the same structure, and when carriage 12 is a home position, with drawing 10 and an embroidery frame 11 like drawing 11 , the cloth attachment frame part 20 and the connection section 21 are connected through the connector section 22 of various longitudinal-direction length so that the center of the cloth attachment frame part 20 of the embroidery frame 11 with which carriage 12 is equipped may be located in a fixed location (for example, location of a sewing needle 6). The cloth attachment frame part 20 is bound tight with outer frame 20a and seating-rim 20b, it has device 20c, sandwiches a processing cloth between outer frame 20a and seating-rim 20b, binds outer frame 20a tight to seating-rim 20b by bolting device 20c, and attaches a processing cloth.

[0038] The detecting element 23-ed detectable [with the pilot switch 56 by the side of carriage 12] is formed in the connection section 21 of an embroidery frame 11. Arrange a pilot switch 56 in a cross direction, it is prepared in a carriage 12 side three, and is made to correspond to these pilot switches 56, and although a maximum of three detecting elements 23-ed can be arranged in forward and backward in the connection section 21 of an embroidery frame 11 and it can prepare in a front location, a back location, and the mid-position between them at it, 1-3 detecting elements 23-ed are arranged by the arrangement pattern of a proper for every class of embroidery frame 11.

[0039] Among said front locations, mid-position, and back locations, two detecting elements 23-ed are formed in a front location and the mid-position at the embroidery frame 11 of drawing 9 , one detecting element 23-ed is formed in a front location at the embroidery frame 11 of drawing 10 , and one detecting element 23-ed is formed in the mid-position at the embroidery frame 11 of drawing 11 .

[0040] As shown in drawing 9 , drawing 12 - drawing 14 , carriage 12 has the mount 26 which is connected with the right edge of the guided member 25 guided to the direction frame 60 of Y of the direction transport station 13 of Y, and this guided member 25, and attaches an embroidery frame 11. A mount 26 has the overhang section 28 jutting out of the standing wall section 27 and the lower limit section of the standing wall section 27 to the method of the right, and is connected with the guided member 25 through the regulatory mechanism 110 (refer to drawing 20 and drawing 21) of the after-mentioned [the standing wall section 27].

[0041] The lock device 40 which locks the connection section 21 of the engagement slot 31 of the engagement device 30 in which make this carriage 12 slide the connection section 21 of an embroidery frame 11 to a cross direction, and it is made to engage with it possible [engaging and releasing], and the embroidery frame 11 which engaged with the frame stowed position through this engagement device 30 possible [discharge] on carriage 12 is established.

[0042] As shown in drawing 12 - drawing 14 , the engagement device 30 is constituted so that it may have the long engagement section 32 in the cross direction formed in the lower limit section of the engagement slot 31 long to the cross direction formed in the overhang section 28 of the mount 26 of carriage 12 from the bottom, and the connection section 21 of an embroidery frame 11 and this engagement section 32 may engage with it possible [a slide into the engagement slot 31]. the length of the engagement section 32 -- the length of the engagement slot 31, and abbreviation - or it is the same, it is somewhat short and is in the condition to which the engagement section 32 engaged with the engagement slot 31, and if those length direction mid gears carry out abbreviation coincidence, a frame stowed position will be equipped with an embroidery frame 11.

[0043] It has come to be unable to carry out the engagement discharge of the embroidery frame 11 from carriage 12 only to a front side in this engagement device 30 in the condition of could not make an embroidery frame 11 engaging with carriage 12 only from a front side, but having engaged the embroidery frame 11 with carriage 12, for example by fitting in and fixing a block member etc. to the back end section of the engagement slot 31.

[0044] The upper surfaces other than engagement slot 31 of the overhang section 28 of carriage 12 are formed in a smooth side, contact section 21a at the left end of the connection section 21 which engages with the upper surface on the left of the engagement slot 31 through the engagement device 30 among this overhang section 28 contacts free [sliding], and the connection section 21 is pressed by the lock member 41 of the lock device 40 which is in this condition and then is explained in full detail at the overhang section 28 of carriage 12.

[0045] As shown in drawing 12 - drawing 16 , the lock device 40 The lock member 41 (moving-part material) covered the press location (detection location) of drawing 12 which presses the connection section 21 of an embroidery frame 11 on carriage 12, and the discharge location (evacuation location) of drawing 15 which cancels press, and guide support of the migration to a longitudinal direction of was enabled possible [a location change] at carriage 12, It has one pair of compression springs 42 prepared in the location corresponding to near the length direction (before or after) both ends of the lock member 41 as an energization member which energizes the lock member 41 to a press location (method of the right).

[0046] The lock member 41 has cross-direction length somewhat shorter than the cross-direction length of the mount 26 of carriage 12, and is arranged in the overhang section 28 bottom. One pair of sliding sections 43 are formed in the lower part near the length direction both ends of the lock member 41, and it is engaged, these sliding section 43 sliding on the sliding section 24 of the connection section 21 of the embroidery frame 11 of said frame stowed position, and the connection section 21 is pressed to the down side. One pair of sliding sections 43 are formed in the sliding section 24 side of an embroidery frame 11, i.e., the height made to project caudad, respectively, and the inferior surface of tongue is formed in the shape of [toward which right-hand side inclined upwards to the migration direction (longitudinal direction) of the lock member 41] a taper.

[0047] One pair of taper guide sections 44 which inclined so that it might be located in the bottom are formed, so that it is isolated forward and backward to the sliding section 43 to the cross-direction both-ends side which are the wearing directions of the embroidery frame 11 of the sliding section 43 by the side of before (height), and the inferior surface of tongue of these tapers guide section 44 is formed in the shape of [toward which right-hand side inclined upwards to the longitudinal direction] a taper, and stands in a row on the inferior surface of tongue of the shape of same taper of the sliding section 43. Here, the upper surface of the sliding section 24 of the connection section 21 of an embroidery frame 11 is formed in the shape of [toward which right-hand side inclined upwards to the longitudinal direction] a taper so that it may be engaged one pair of sliding sections 43 and the letter of field contact of the lock member 41.

[0048] In order to show the lock member 41 of the lock device 40 free [migration] to a press location and a discharge location The 1st and 2nd guide shafts 45 and 46 are established, and these guide shafts 45 and 46 are inserted in the guidance holes 47 and 48 of the lock member 41, respectively. The 1st guide shaft 45 and its guidance hole 47 The minute migration of the lock member 41 to the longitudinal direction which is the slide direction of the connection

section 21 of an embroidery frame 11 is permitted. The 2nd guide shaft 46 and its guidance hole 48 It is constituted so that the tilt of the lock member 41 in the field which forbids the minute migration of the lock member 41 to a longitudinal direction, and contains the axial center of the 1st and 2nd guide shafts 45 and 46 may be permitted.

[0049] The 1st guide shaft 45 was formed in the location corresponding to near the length direction both ends of the lock member 41 one pair, the 2nd guide shaft 46 was formed in the mid-position between these 1st guide shafts 45, and these guide shafts 45 and 46 fixed the left end section in the standing wall section 27 of the mount 25 of carriage 25, respectively, were prolonged rightward, and have inserted in the guidance holes 47 and 48. Sheathing of said one pair of compression springs 42 is carried out to one pair of 1st guide shafts 45 between the standing wall section 27 and the lock member 41, respectively, and they have made powerful the energization force of the compression spring 42 on the backside [force / of the compression spring 42 on three arrangement of a pilot switch 56, and by the side of before / energization].

[0050] As shown in drawing 13 and drawing 14 , the guidance hole 48 which the guidance hole 47 which the 1st guide shaft 45 inserts in is a gold coin hole long and slender to a longitudinal direction, and the 2nd guide shaft 46 inserts in is a gold coin hole long and slender in the vertical direction (direction which intersects perpendicularly with the direction of an axial center of the guide shaft 46, and intersects perpendicularly with the slide direction of the connection section 21 of an embroidery frame 11). In the right-hand side of one pair of guidance holes 47, it escapes at the right edge of one pair of 1st guide shafts 45, and is equipped with stop ring 45a in the shape of outside attachment so that the lock member 41 energized by the compression spring 42 to the method of the right may not escape from the guide shafts 45 and 46.

[0051] As shown in drawing 9 - drawing 14 , the positioning device 50 in which the embroidery frame 11 engaged through the engagement device 30 is positioned to said frame stowed position is established. With the lobe 51 prepared in the lock member 41, this positioning device 50 is formed in an embroidery frame 11, and has the concave 52 which a lobe 51 can engage and release. A lobe 50 is formed in the right edge of the center of the length direction of the lock member 41, in the connection section 21 of an embroidery frame 11, it is formed in the center of the length direction of the connection section 21, and this lobe 51 engages with a concave 52, an embroidery frame 11 is locked by slide impossible and a concave 52 is positioned in a frame stowed position.

[0052] Moreover, as shown in drawing 9 - drawing 11 , in case the frame stowed position of carriage 12 is equipped with an embroidery frame 11 through the engagement device 30, the guide section 55 which guides the lock member 41 and is switched to a discharge location is formed in the embroidery frame 11. This guide section 55 is continued and formed in the section from the center of the length direction of the connection section 21 in the connection section 21 of an embroidery frame 11 that second half. Straight line guide section 55a of that length direction anterior part, Having curve guide section 55b which is located in the length direction posterior part and curves from the back end of straight line guide section 55a to the method of the right gently, the left surface front end of the guide section 55 stands in a row in the left back end of said concave 52.

[0053] as shown in drawing 9 - drawing 11 , three pilot switches 56 which detect the detecting element 23-ed of an embroidery frame 11 to the lock member 41 arrange to a cross direction -- having -- method ** of length of the lock member 41 -- it is prepared in the condition of having inclined toward the backside to the center position mostly, and constitutes from a pilot switch 56 possible [detection of the detecting element 23-ed of an embroidery frame 11] in the condition that the lock member 41 was switched to the press location. Each pilot switch 56 is an on-off switch which has detection lever 56a which can contact the detecting element 23-ed, said detecting element 23-ed consists of a height which projects to the detection lever 56a side, i.e., left-hand side, and this detecting element 23-ed of 1-3 is arranged by the arrangement pattern of a proper for every class of embroidery frame 11 in each embroidery frame 11 as mentioned above.

[0054] The magnitude of the cloth attachment frame part 20 of drawing 10 is about 100x100. If an embroidery frame 11 is used as the highest embroidery frame 11 of operating frequency, one detecting element 23-ed corresponding to the pilot switch (located most ahead) 56 located in the upstream in the case of the penetration at the time of embroidery frame wearing is formed in the embroidery frame 11 with this high operating frequency. In addition, it becomes detectable [the existence of wearing of an embroidery frame 11, and seven kinds of embroidery frames 11 with which it is equipped] by having formed three pilot switches 56.

[0055] The long and slender substrate 57 is formed in the lock member 41 fixed at a cross direction, and while three pilot switches 56 are fixed to this substrate 57, it connects electrically. And the connector 58 which connects wiring of a substrate 57 to this substrate 57 electrically was formed, and the common wiring code 105 (refer to drawing 9 and drawing 12) which includes wiring of each pilot switch 56 from this connector 58 is prolonged.

[0056] Here, attachment and detachment of the embroidery frame 11 to carriage 12 are explained. As shown in drawing

16, in the condition of having not equipped carriage 12 with the embroidery frame 11, the lock member 41 energized by the compression spring 42 to the method of the right falls out, and it is stopped by stop ring 45a, and is located in a right marginal location. The engagement section 32 of the connection section 21 is made to engage with the engagement slot 31 so that the connection section 21 of an embroidery frame 11 may be inserted from a before side, and the connection section 21 is made to slide back between the overhang section 28 of carriage 12, and the lock member 41 from this condition.

[0057] Since the front end section of the guide section 55 of the connection section 21 is located on the right of the right end of the lobe 51 of the lock member 41 located in a right marginal location in that case, Without the guide section 55 which moves back colliding with a lobe 51, curve guide section 55b engages with a lobe 51, a lobe 51 is pushed to left-hand side, a change and straight line guide section 55a engage the lock member 41 with a discharge location at a lobe 51, and the lock member 41 is held in a discharge location. At this time, the lock member 41 switches to a discharge location smoothly, tilting in the field containing the axial center of the 1st and 2nd guide shafts 45 and 46.

[0058] In addition, the guide section 55 engages with the lock member 41 directly, and even if the front end section of the guide section 55 of the connection section 21 is located on the left of the right end of the lobe 51 of the lock member 41 located in a right marginal location, it can constitute so that the lock member 41 may be pushed to a left, so that it can engage with a lobe 51 after that, as it is located on the right of the right end of a lobe 51. It moves to a left smoothly, tilting in the field which contains the axial center of the 1st and 2nd guide shafts 45 and 46 also in this case.

[0059] After it made the lobe 51 engage with the guide section 55 and the lock member 41 has switched to the discharge location, the connection section 21 is made to slide further back, the cross-direction location of a lobe 51 and a concave 52 is in agreement, and an embroidery frame 11 arrives at a frame stowed position. Then, while the lock member 41 moves to the method of the right according to the energization force of a compression spring 42 and a lobe 51 engages with a concave 52, one pair of sliding sections 43 of the lock member 41 are engaged sliding on one pair of sliding sections 24 of the connection section 21, and press and lock the connection section 21 on carriage 12.

[0060] In addition, after an operator is in the condition which switched the lock member 41 to the discharge location manually and equips a frame stowed position with the connection section 21 of an embroidery frame 11, of course, it is also possible to carry out in the procedure which lifts a hand from the lock member 41 and locks the connection section 21 by the lock member 41. Moreover, in demounting an embroidery frame 11 from carriage 12, as shown in drawing 15, an operator switches the lock member 41 to a discharge location manually, and makes engagement of a lobe 51 and a concave 52 cancel, and an embroidery frame 11 is made to slide to the front, and it demounts it.

[0061] As shown in drawing 8, drawing 17 - drawing 19, the direction transport station 13 of Y has the direction drive system 70 of Y with which the direction frame 60 of Y which enables guide support of the migration of carriage 12 to a cross direction, and this direction frame 60 of Y are equipped and which drives carriage 12 to a cross direction.

[0062] The direction frame 60 of Y has the direction frame main part 61 long to a cross direction of Y, and the pilot flame 62 which was arranged in the bottom and fixed to the direction frame main part 61 of Y at order both ends, the lower part of a pilot flame 62 is held in a case 15, and the upper part of a pilot flame 62 and the direction frame main part 60 of Y are arranged in the case 15 bottom. The interior material 64 of a proposal is formed in the location isolated to the longitudinal direction to the long guidance shaft 63 and this guidance shaft 63 on the direction frame main part 60 of Y at the cross direction which shows carriage 12 to a cross direction.

[0063] The guidance shaft 63 is the configuration which it was arranged in the right part of the direction frame main part 61 of Y, and the both ends of the guidance shaft 63 fixed in the direction frame main part 61 order both-sides wall of Y, and the interior material 64 of a proposal was arranged by the left part of the direction frame main part 61 of Y, was fixed to the pars basilaris ossis occipitalis of the direction frame main part 61 of Y, started upwards, and was crooked to the left. And the guided member 25 of carriage 12 is attached outside by the guidance shaft 63 free [sliding], and engagement section 25a of the KO typeface at the left end of the guided member 25 is engaging with the upper limit section of the interior material 64 of a proposal free [sliding] from left-hand side.

[0064] The direction drive system 70 of Y has the pulleys 74 and 75 of the direction electric motor 71 of Y, the drive gear 72, and 73 or 1 pair of major-diameter gear, and a timing belt 76, transmits the driving force of the direction electric motor 71 of Y to carriage 12, and drives carriage 12 to a cross direction. It was arranged by the one where the amount of overhangs is smaller, i.e., a front end portion, among those for both ends before and after ****ing to the case 15 order both sides of the movable case 16, and it turned upward, and was fixed to the front end inferior surface of tongue of the pars basilaris ossis occipitalis of the direction frame main part 61 of Y, and the drive gear 72 has fixed the direction electric motor 71 of Y to the output shaft of the direction electric motor 71 of Y inserted in to the pars-basilaris-ossis-occipitalis bottom.

[0065] It was supported pivotably free [rotation of the major-diameter gear 73 and pulley 74 which fixed on the same

axle to the anterior part of the direction frame main part 61 of Y], and the drive gear 72 meshes with the major-diameter gear 73. It is supported pivotably by the posterior part of the direction frame main part 61 of Y free [rotation of a pulley 75], and the endless-like timing belt 76 is ****(ed) by these pulleys 74 and 75. A timing belt 76 is arranged between the guidance shaft 63 and the interior material 64 of a proposal, and the part is connected with carriage 12.

[0066] The direction transport station 14 of X has the direction drive system 90 of X with which the direction frame 80 of X which is prepared in the direction frame 60 bottom of Y, and enables guide support of the migration of the direction frame 60 of Y to a longitudinal direction, and this direction frame 80 of X are equipped and which drives the direction frame 60 of Y to a longitudinal direction. The interior material 82 (guide section) of a proposal is formed in the location isolated to the cross direction to the long guidance shaft 81 and this guidance shaft 81 on the direction frame 80 of X at the longitudinal direction which shows the direction frame 60 of Y to a longitudinal direction.

[0067] It was arranged in the posterior part of the direction frame 80 of X, and the both ends of the guidance shaft 81 fixed to the right-and-left both-sides wall of the direction frame 80 of X, the interior material 82 of a proposal was arranged in the anterior part of the direction frame 80 of X, it was fixed to the side wall before the direction frame 80 of X, and the guidance shaft 81 is prolonged to the front. The engagement section 84 of the typeface of KO guided to the pilot flame 62 of the direction frame 60 of Y by being engaged free [sliding] from a before side at said interior material 82 of a proposal in the location isolated to the cross direction to one pair of these interior [83] 83 of a proposal-ed and a proposal-ed guided to the guidance shaft 81 is formed. One pair of interior 83 of a proposal-ed is established to some extent in the location which carried out phase isolation to the longitudinal direction.

[0068] The direction drive system 90 of X has the pulleys 94 and 95 of the direction electric motor 91 of X, the drive gear 92, and 93 or 1 pair of major-diameter gear, and a timing belt 96, transmits the driving force of the direction electric motor 91 of X to a pilot flame 62, and drives the direction frame 60 of Y to a longitudinal direction. It turned upward, and was fixed to the lower right side of the pars basilaris ossis occipitalis of the direction frame 80 of X, and the drive gear 92 has fixed the direction electric motor 91 of X to the output shaft of the direction electric motor 91 of X inserted in to the pars-basilaris-ossis-occipitalis bottom.

[0069] It was supported pivotably free [rotation of the major-diameter gear 93 and pulley 94 which fixed on the same axle to the right part of the direction frame 80 of X], and the drive gear 92 meshes with the major-diameter gear 93. It is supported pivotably by the left part of the direction frame 80 of X free [rotation of a pulley 95], and the endless-like timing belt 96 is ****(ed) by these pulleys 94 and 95. A timing belt 96 is arranged between the guidance shaft 81 and the interior material 82 of a proposal, and the part is connected with the pilot flame 62.

[0070] As shown in drawing 8 , drawing 17 , and drawing 18 , the pilot flame 62 of the direction frame 60 of Y has really formed ***** 62b and 62c so that it may start upwards from abbreviation inverse triangle-like a [base section 62] and base section 62a order both ends in plane view, and is formed in the concave in side view.

[0071] As shown in drawing 1 , drawing 17 , and drawing 18 , they are one pair of slits 100,101 long to a longitudinal direction on the upper wall and side wall of a case 15. It is formed and the front end section of base section 62a among pilot flames is a slit 100. It inserts in free [migration] and ***** 62c is a slit 101. It has inserted in free [migration]. Thus, since the slit 100,101 was formed in the upper wall and side wall of a case 15, it can prevent that dust and dust, such as waste thread and a rag, invade in a case 15 as much as possible. In addition, the upper limit portion of ***** 62b and 62c is connected with the direction frame main part 61 of Y, one pair of interior 83 of a proposal-ed is established in the posterior part bottom of base section 62a, and the engagement section 84 is formed in the anterior part bottom.

[0072] As shown in drawing 8 and drawing 12 , in the left end section of the direction frame main part 61 of Y of the direction frame 60 of Y Wiring code 105 prolonged in a case 15 from a pilot switch 56 Code supporter 106 long to the cross direction guided along with a cross direction in support of most It is prepared. This code supporter 106 It has side wall 106b which starts from the left-hand side of bottom wall 106a and bottom wall 106a. Wiring code 105 Wiring code 105 which supported by bottom wall 106a and was supported by bottom wall 106a Along with a cross direction, it shows around by side wall 106b, and omission from bottom wall 106a are prevented.

[0073] it is shown in drawing 8 , drawing 9 , and drawing 12 -- as -- wiring code 105 This wiring code 105 that is a band-like code with flexibility and is prolonged from the connector 58 of a substrate 57 the inside of the movable case 16 -- setting -- a carriage 12 top -- a passage -- the direction frame main part 61 of Y -- it shows around to the interior material 64 of a proposal, it becomes the vertical sense from there, and is supported by bottom wall 106a. Wiring code 105 which left carriage 12 Being supported by bottom wall 106a, for example, after extending back along with the interior material 64 of a proposal first, a U-turn is made, and along with side wall 106b, it extends to the front.

[0074] Thus, slit 100 of the upper wall of a case 15 Wiring code 105 guided to the top location The wiring code 105 which changes the sense downward and is prolonged from the direction frame main part 61 of Y Slit 100 of the upper

wall of a case 15 It is made to have shown around into the case 15 along with the pilot flame 62 to insert in. Moreover, it is the slit 101 of the side wall of a case 15 about the code prolonged from the direction electric motor 71 of Y which is formed in the direction frame main part 61 of Y, and drives carriage 12 to a cross direction although not illustrated. Along with the pilot flame 62 to insert in, it shows around into a case 15.

[0075] As shown in drawing 7, it is a connector 109 to the right edge of a case 17. It is prepared. This connector 109 If said wiring code 105, the code prolonged from the direction electric motor 71 of Y, and the code prolonged from the direction electric motor 91 of X are connected and the base section 1 is equipped with a case 15 Connector 109 It connects with the connector (illustration abbreviation) prepared in the left end section of the base section 1, and said code is electrically connected to the control unit and power supply of a sewing machine M.

[0076] Now, regulatory mechanism 110 which adjusts the height location of a mount 26 to the guided member 25 of carriage 12 as shown in drawing 20 and drawing 21 It is prepared. This regulatory mechanism 110 Long hole 111 long and slender in the height direction formed in the standing wall section 27 of a mount 26 This long hole 111 Screw member 112 which inserts in and concludes the guided member 25 and a mount 26 possible [discharge] It has.

[0077] Screw member 112 Where it loosened and conclusion of the guided member 25 and a mount 26 is canceled, it is a long hole 111. It receives and is the screw member 112. You can make it able to go up and down a mount 26, height control can be performed, making it guide, and it is the screw member 112 after height centering control. The guided member 25 and a mount 26 can be concluded in total, and the height location of an embroidery frame 11 can be fixed.

[0078] Moreover, the 2nd regulatory mechanism 115 which the height location of the portion supported through the interior material 82 of a proposal among the direction frames 60 of Y is adjusted [regulatory mechanism], and rotates the direction frame 60 of Y to the circumference of the guidance shaft 81 as shown in drawing 18, drawing 19, drawing 22, and drawing 23 It is prepared. This 2nd regulatory mechanism 115 Two or more long holes 116 long and slender in the height direction formed in the interior material 82 of a proposal These long holes 116 Two or more screw members 117 which insert in, respectively and conclude the direction frame 80 of X, and the interior material 82 of a proposal possible [discharge] It has.

[0079] Two or more screw members 117 Where it loosened and conclusion of the direction frame 80 of X and the interior material 82 of a proposal is canceled Long hole 116 It receives and is the screw member 117. Making it guide, you can make it able to go up and down the direction frame 60 of Y in one with the interior material 82 of a proposal, and the posture of carriage 12 11, i.e., an embroidery frame, can be adjusted. It is the screw member 117 after posture accommodation. The direction frame 80 of X and the interior material 82 of a proposal are concluded in total, and the posture of an embroidery frame 11 can be fixed.

[0080] An operation and effect of the above-mentioned embroidery frame concrete supply system 10 are explained. The lock member 41 which the lock device 40 covered the press location which presses the connection section 21 of an embroidery frame 11 on carriage 12, and the discharge location which cancels press, and was supported by carriage 12 free [migration], Have the compression spring 42 which energizes this lock member 41 to a press location, and it sets in the lock device 40. The sliding section 43 of the lock member 41 was made to project to the sliding section 24 side down side of the connection section 21, and these sliding sections 24 and 43 were formed in the shape of [which inclined to the migration direction of the lock member 41] a taper.

[0081] Therefore, since the energization force is doubled the power and transmitted to the sliding section 24 of the sliding section 43 to the connection section 21 of the lock member 41 even if it sets the energization force of a compression spring 42 as the comparatively weak energization force, the connection section 21 of the embroidery frame 11 engaged through the engagement device 30 is powerfully pressed on carriage 12 by the lock member 41, and can certainly be locked.

[0082] That is, since the sliding sections 24 and 43 were made into the taper configuration, the energization force of a compression spring 42 is transmitted to the 2-way of a lower part and the method of the right to the connection section 21 through the sliding section 43 of the lock member 41, and the connection section 21 is powerfully pressed by carriage 12. Since the energization force of a compression spring 42 can be especially transmitted to said 2-way to the sliding section 24 of the sliding section 43 to the connection section 21 of the lock member 41, The engagement section 32 prepared in the lower limit section of the connection section 21 is pressed by the force of said 2-way to the inside of the engagement slot 32 of carriage 12, and thereby, even if it sets the energization force of a compression spring 42 as the comparatively weak energization force, the connection section 21 can be powerfully locked on carriage 12.

[0083] So, it becomes possible to do easily the attachment-and-detachment activity of an embroidery frame 11 done after the operator could operate the lock member 41 by the comparatively weak force, could also make it move to a discharge location and has moved the lock member 41 to the discharge location. Since one pair of sliding section 43 was especially formed near the length direction both ends of the lock member 41, one pair of sliding sections 43 of the lock

member 41 are certainly contacted in the sliding section 24 of the connection section 21, and the connection section 21 is certainly pressed on carriage 12, and can be locked on it.

[0084] Since the taper guide section 44 was formed in the cross-direction both-ends side of the sliding section 43 which is a height of the lock member 41 When the lock member 41 is located in a discharge location and the direction of the opposite side rather than a press location in the condition that carriage 12 is not equipped with the embroidery frame 11, In case carriage 12 is equipped with an embroidery frame 11, the connection section 21 of an embroidery frame 11 is guided to the taper guide section 44. Carriage 12 can be equipped with an embroidery frame 11, even if it can prevent that the connection section 21 is caught in the sliding section 43, and it carries out the direct control of the lock member 41 and it does not switch to a discharge location.

[0085] When the lock device 40 is formed in carriage 12, and it is inserted in the guidance holes 47 and 48 of the lock member 41, respectively and it shows the lock member 41 free [migration] to a press location and a discharge location, it has the 1st and 2nd guide shafts 45 and 46. While the 1st guide shaft 45 and its guidance hole 47 permit the minute migration of the lock member 41 to a longitudinal direction, the 2nd guide shaft 46 and its guidance hole 48 It constituted so that the tilt of the lock member 41 in the field which forbids the minute migration of the lock member 41 to a longitudinal direction, and contains the axial center of the 1st and 2nd guide shafts 45 and 46 might be permitted.

[0086] Therefore, in case the lock member 41 continues and moves to a press location and a discharge location through the 1st and 2nd guide shafts 45 and 46, the lock member 41 tilts in the field containing the axial center of the 1st and 2nd guide shafts 45 and 46, there is no possibility of becoming complicated to the guide shafts 45 and 46, and a possibility of locking in migration impossible is also lost. That is, a press location and a discharge location can be covered, the lock member 41 can be switched certainly smoothly, and the process tolerance of the guidance holes 47 and 48 and the assembly precision of the guide shafts 45 and 46 over a longitudinal direction can be eased.

[0087] Since it is a gold coin hole long and slender in the vertical direction in which the direction of an axial center of the 2nd guide shaft 46 and the guidance hole 48 which the 2nd guide shaft 46 inserts in cross at right angles, and intersects perpendicularly with the slide direction of said connection section 21 In the condition of having made the 1st guide shaft 45 inserting in the guidance hole 47, it is assembly-easy and becomes so that the 2nd guide shaft 46 may be made to insert in the guidance hole 48, and the process tolerance of the guidance holes 47 and 48 and the assembly precision of the guide shafts 45 and 46 can be eased.

[0088] While forming the detecting element 23-ed in the connection section 21 of an embroidery frame 11, the pilot switch 56 which detects the detecting element 23-ed to the lock member 41 was formed, and it constituted from a pilot switch 56 possible [detection of the detecting element 23-ed of an embroidery frame 11] in the condition of having switched the lock member 41 to the press location. Therefore, as the pilot switch 56 can hardly contact the detecting element 23-ed and the other portion of the embroidery frame [/ in the case of attachment and detachment of an embroidery frame 11] 11, it can detach and attach an embroidery frame 11 smoothly, it can prevent deterioration of a pilot switch 56, and can raise endurance.

[0089] And since it constituted so that the lock member 41 might be switched to a press location when the lock member 41 was held in the discharge location on the occasion of attachment and detachment of an embroidery frame 11 and the frame stowed position was equipped with the embroidery frame 11, it can detect certainly, without incorrect-detecting the detecting element 23-ed of the embroidery frame 11 with which carriage 12 is equipped. Since three pilot switches 56 were put in order and formed in carriage 12 at the cross direction and 1-3 detecting elements 23-ed corresponding to 1-3 pilot switches 56 were formed in the connection section 21 of an embroidery frame 11, 1-3 detecting elements 23-ed are arranged by the arrangement pattern of a proper for every class of embroidery frame 11, and the class of embroidery frame 11 with which carriage 12 was equipped can be detected.

[0090] Since one detecting element 23-ed corresponding to the pilot switch 56 located in the upstream in the case of the penetration at the time of embroidery frame wearing was formed in the embroidery frame 11 with high operating frequency In case the embroidery frame 11 with high operating frequency is detached and attached on carriage 12, in order for the remaining pilot switches 56 other than said one pilot-switch 56 to completely contact said one detecting element 23-ed, Deterioration of the remaining pilot switch 56 can be prevented more certainly, and endurance can be raised.

[0091] three pilot switches 56 -- method ** of length of the lock member 41, since it was prepared in the condition of having inclined toward the backside to the center position mostly and the compression spring 42 by the side of after that was made more powerful than the energization force of the compression spring 42 by the side of before While the lock member 41 is switched to a press location and being able to detect certainly the detecting element 23-ed of an embroidery frame 11 By one pair of compression springs 42, in a press location, the lock member 41 is energized, where balance is maintained at the whole abbreviation target, and the connection section 21 of an embroidery frame 11

can be stably locked on carriage 12.

[0092] That is, if three pilot switches 56 are formed in the condition of having inclined toward the backside to the length direction center of the lock member 41, in case a pilot switch 56 detects the detecting element 23-ed of an embroidery frame 11, the detection load to the discharge location direction will be received, and the force will incline and act on the backside to the length direction center of the lock member 41. So, by making the compression spring 42 on the backside more powerful than the energization force of the compression spring 42 by the side of before, on the whole abbreviation target, the lock member 41 is energized in a press location, where balance is maintained, and the connection section 21 of an embroidery frame 11 can certainly be stably locked on carriage 12. That is, it becomes possible to form three pilot switches 56 in the condition of having inclined to the length direction center of the lock member 41, satisfactory.

[0093] Since the lobe 51 prepared in the lock member 41 and the positioning device 50 in which it is prepared in an embroidery frame 11, had the concave 52 which a lobe 51 can engage and release, a lobe 51 engaged with a concave 52, and an embroidery frame 11 was positioned to said frame stowed position were established In order to detect the detecting element 23-ed certainly by the pilot switch 56, where it made the lobe 51 engage with a concave 52 and an embroidery frame 11 is positioned to a frame stowed position, the lock member 41 can be certainly switched to a press location.

[0094] Since the guide section 55 which guides the lock member 41 and is switched to an evacuation location was formed in the connection section 21 of an embroidery frame 11 when equipping the frame stowed position of carriage 12 with an embroidery frame 11 through the engagement device 30, in case an embroidery frame 11 detaches and attaches an embroidery frame 11 in the condition of being located in addition to a frame stowed position, the lock member 41 can be certainly switched to a discharge location, and can be held.

[0095] Since the substrate 57 which connects three pilot switches 56 to the lock member 41 electrically was formed, the wiring corresponding to three pilot switches 56 is packed through a substrate 57, and it is the wiring code 105. It is connectable with a control unit etc. And since the connector 58 which connects wiring of a substrate 57 electrically was formed in said substrate 57, connection and separation of wiring of a substrate 57 can be performed easily, and it becomes convenient at the times, such as an assembly of the embroidery frame concrete supply system 10, and a maintenance.

[0096] Wiring code 105 prolonged in a case 15 from a pilot switch 56 Code supporter 106 guided along with a cross direction in support of most Since it prepared in the direction frame main part 61 of Y Wiring code 105 prolonged in a case 12 from the pilot switch 56 of the carriage 12 which moves to a cross direction Can arrange tidily, can show around certainly into a case 15, and the direction frame 60 of Y is covered in the movable case 16. It is the wiring code 105 in the movable case 16. Since most can be held, it is the wiring code 105. It can prevent that dust and dust adhere.

[0097] The guidance shaft 81 and the guide member 82 are formed [at the direction frame 80 of X / a longitudinal direction] in the location which carried out phase isolation for a long time a cross direction. The direction frame 60 of Y The interior 83 of a proposal-ed which has the pilot flame 62 which was arranged in the direction frame main part 61 long to a cross direction of Y, and its bottom, and was fixed to the direction frame main part 61 of Y at both ends, and is guided to this pilot flame 62 at the guidance shaft 81, The engagement section 84 guided by the guide member 82 in the location isolated in the direction of Y to this interior 83 of a proposal-ed was formed.

[0098] Thus, the both ends of a pilot flame 62 are fixed to the direction frame main part 61 of Y. In order to carry out guide support of the interior 83 of a proposal-ed and the engagement section 84 which were isolated to the cross direction of this pilot flame 62 by the guidance shaft 81 and the guide member 82 of the direction frame 80 of X, Guide support of the migration to a longitudinal direction can be enabled in the condition that the direction frame 60 of Y was stabilized on the direction frame 80 of X. And the interior 83 of a proposal-ed and the engagement section 84 of a pilot flame 62 can be made to be able to approach a cross direction comparatively, and it can prepare, and thereby, the structure of transport stations 13 and 14 can be simplified and manufacture cost can be reduced.

[0099] The amount of overhangs arranged the direction electric motor 71 of Y in the small front end portion among those for both ends before and after having constituted the movable case 16 where it was arranged in the case 15 bottom and the direction transport station 13 of Y was held so that it might **** to case 15 order both sides, and jutting it out to the case 15 order both sides of this movable case 15. Therefore, while being able to take the large migration stroke of the cross direction of carriage 16 By having arranged the direction electric motor 71 of Y in the interior of the movable case 16 Become unnecessary to form the slit which the output shaft of the direction electric motor 71 of Y inserts in a case 15, and the structure of a case 15 simplifies. Since dust, dust, etc. stop being able to enter easily in a case 15 and the output shaft of the direction electric motor 71 of Y stops being outside exposed further, a possibility that thread may twine round the output shaft is also lost.

[0100] And since the amount of overhangs of the movable case 16 is arranging the direction electric motor 71 of Y in a

small front end portion when carriage 12 moves to the backside greatly, it can prevent that the overall center of gravity of the carriage 12 which attached the embroidery frame 11 (processing cloth), and the direction transport station 13 of Y inclines toward the backside too much, weight balance can be maintained, and carriage 12 and an embroidery frame 11 can be moved without a backlash with the stable posture. Moreover, since it can constitute so that carriage 12 may be moved back greatly rather than the front, as a back end portion is greatly jutted out of a case 15 rather than the front end portion of the movable case 16, it can prevent becoming an obstacle of the operator who works from a before [the embroidery frame concrete supply system 10] side as much as possible.

[0101] The modification gestalt of said embroidery frame concrete supply system 10 is explained.

1) Only one side of the sliding section 24 of an embroidery frame 11 and the sliding section 43 of the lock member 41 may be formed in the shape of [which inclined to the migration direction of the lock member 41] a taper.

2) It is possible to omit at least one taper guide section 44 by the side of the right-and-left both ends of the sliding section 43.

[0102] 3) In the engagement device 30, an engagement slot may be established in the lock member 41, and the engagement section engaged possible [a slide into this engagement slot] may be prepared in carriage 12.

In 4) positioning device 50, a lobe may be prepared in an embroidery frame 11 and the concave which this lobe can engage and release may be prepared in the lock member 41.

[0103] 5) Two or two or more four pilot switches 56 or more may be formed in carriage 12, and 1, 1 corresponding to two or more pilot switches 56, or two or more detecting elements-ed may be prepared in the connection section of an embroidery frame. When the number of pilot switches 56 is n, it becomes possible to detect the embroidery frame 11 of a class (2n-1). In addition, what is necessary is just to form one pilot switch 56, in detecting only the existence of wearing of an embroidery frame 11.

6) In the lock device 40, 1, or three the 1st guide shaft and its guidance hole or more may be prepared.

[0104] 7) Regulatory mechanism 110 Set, form a long and slender long hole in the vertical direction at the guided member 25, a screw member is made to insert in this long hole, and you may make it conclude the guided member 25 and a mount 26 possible [discharge].

8) The 2nd regulatory mechanism 115 Set, form two or more long and slender long holes in the vertical direction at the direction frame 80 of X, two or more screw members are made to insert in these long holes, respectively, and you may make it conclude the direction frame 80 of X, and the interior material 82 of a proposal possible [discharge].

[0105] 9) It is not the thing of one and the lock member 41 may consist of two or more members.

10) The sliding section 43 may be formed in locations other than the both ends of the lock member 41, it is not one pair and the three or more sliding sections 43 may be formed.

[0106] In addition, it is the range which does not deviate from the meaning of this invention, and it is also possible to carry out with the gestalt which added various modification of those other than said modification gestalt.

[0107]

[Effect of the Invention] according to the embroidery frame concrete supply system of claim 1 -- carriage -- a detection location and an evacuation location -- continuing -- a location -- switchable moving-part material was prepared, the pilot switch for detecting the detecting element-ed of an embroidery frame to this moving-part material was prepared, and it constituted from a pilot switch possible [detection of a detecting element-ed] in the condition of having switched said moving-part material to the detection location. Therefore, as the pilot switch can hardly contact the detecting element-ed and the other portion of an embroidery frame [/ in the case of attachment and detachment of an embroidery frame], it can detach and attach an embroidery frame smoothly, it can prevent deterioration of a pilot switch, and can raise endurance. And if moving-part material is held in an evacuation location in the case of attachment and detachment of an embroidery frame and a frame stowed position is equipped with an embroidery frame, it can detect certainly with constituting moving-part material possible [a change in a detection location], without incorrect-detecting the detecting element-ed of the embroidery frame with which carriage is equipped.

[0108] According to the embroidery frame concrete supply system of claim 2, the engagement device in which the connection section of an embroidery frame is made to engage with carriage possible [engaging and releasing], and the lock device which locks on carriage the connection section of the embroidery frame which engaged with the frame stowed position through this engagement device possible [discharge] were established. And the moving-part material which the lock device covered the press location which presses said connection section on carriage, and the discharge location which cancels press, and was supported by carriage free [migration], It had the energization member which energizes this moving-part material to a press location, while preparing the detecting element-ed in said connection section, the pilot switch which detects a detecting element-ed was prepared in moving-part material, and it constituted from a pilot switch possible [detection of the detecting element-ed of an embroidery frame] in the condition of having

switched moving-part material to the press location.

[0109] Therefore, as the pilot switch can hardly contact the detecting element-ed and the other portion of an embroidery frame [/ in the case of attachment and detachment of an embroidery frame], it can detach and attach an embroidery frame smoothly, it can prevent deterioration of a pilot switch, and can raise endurance. If moving-part material is held in a discharge location in the case of attachment and detachment of an embroidery frame and a frame stowed position is equipped with an embroidery frame, moving-part material by and the thing constituted possible [a change in a press location] Since it can detect certainly, without incorrect-detecting the detecting element-ed of the embroidery frame with which carriage is equipped, said connection section is further pressed on carriage by moving-part material and it was made to equip, neither so high process tolerance nor assembly precision is needed, but it can prevent that manufacture cost becomes expensive.

[0110] If moving-part material is switched to a detection location (press location) where a frame stowed position is equipped with an embroidery frame, since it consisted of a height in which it is the on-off switch which has the detection lever to which a pilot switch can contact a detecting element-ed according to the embroidery frame concrete supply system of claim 3, and a detecting element-ed [said] projects to a detection lever side, since the rocking lever of a pilot switch will contact the height of an embroidery frame and it will rock, a detecting element-ed [of an embroidery frame] is certainly detectable by the pilot switch.

[0111] According to the embroidery frame concrete supply system of claim 4, since it has the engagement section engaged it is prepared in the engagement slot and another side which were established in one side of the connection section of carriage and an embroidery frame, and possible [a slide into said engagement slot], an engagement device can press said connection section engaged through this engagement device by the lock member in said receptacle section. And since the connection section of an embroidery frame can be made to slide between carriage and a lock member, in case it is attachment and detachment of an embroidery frame, it is not necessary to evacuate a lock member to a discharge location greatly, and overall structure can be miniaturized and simplified.

[0112] Since according to the embroidery frame concrete supply system of claim 5 two or more pilot switches were put in order and prepared in the embroidery frame wearing direction at carriage, 1, 1 corresponding to two or more pilot switches, or two or more detecting elements-ed were prepared in the connection section of an embroidery frame and these 1 or two or more detecting elements-ed have been arranged by the arrangement pattern of a proper for every class of embroidery frame, the class of embroidery frame with which carriage was equipped can be detected. And in case it equips making an embroidery frame slide through said engagement device, it can constitute so that a pilot switch may hardly contact the detecting element-ed of an embroidery frame.

[0113] Since one detecting element-ed corresponding to the pilot switch located in the upstream in the case of the penetration at the time of embroidery frame wearing was prepared in the embroidery frame with high operating frequency according to the embroidery frame concrete supply system of claim 6 In case an embroidery frame with high operating frequency is detached and attached on carriage, in order for the remaining pilot switches other than the pilot switch located in the upstream in the case of the penetration at the time of embroidery frame wearing to completely contact said detecting element-ed, Deterioration of the pilot switch of said remaining pilot switch can be prevented more certainly, and endurance can be raised.

[0114] Since the lobe prepared in moving-part material and the positioning device in which it is prepared in an embroidery frame, had the concave which a lobe can engage and release, a lobe engaged with a concave, and an embroidery frame was positioned to said frame stowed position were established according to the embroidery frame concrete supply system of claim 7 In order to detect a detecting element-ed certainly by the pilot switch, where it made the lobe engage with a concave and an embroidery frame is positioned to a frame stowed position, moving-part material can be switched to a detection location (press location).

[0115] Since according to the embroidery frame concrete supply system of claim 8 the guide section which guides moving-part material and is switched to an evacuation location or a discharge location was prepared in the connection section or the moving-part material of an embroidery frame when equipping the frame stowed position of carriage with an embroidery frame through an engagement device, in case an embroidery frame detaches and attaches an embroidery frame in the condition are located in addition to a frame stowed position, moving-part material can be certainly held in an evacuation location or a discharge location.

[0116] Since the substrate which connects two or more pilot switches to moving-part material electrically was formed according to the embroidery frame concrete supply system of claim 9, two or more wiring corresponding to two or more pilot switches is packed through the substrate formed in moving-part material, and it can connect with the control unit of an embroidery frame concrete supply system etc.

[0117] Since the connector which connects wiring of a substrate to the control unit of an embroidery frame concrete

supply system electrically was prepared in said substrate according to the embroidery frame concrete supply system of claim 10, the connection and separation to the control unit of an embroidery frame concrete supply system of wiring of a substrate can be performed easily, and it becomes convenient at the times, such as an assembly of an embroidery frame concrete supply system, and a maintenance.

[Translation done.]

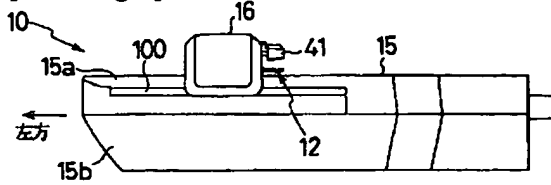
*** NOTICES ***

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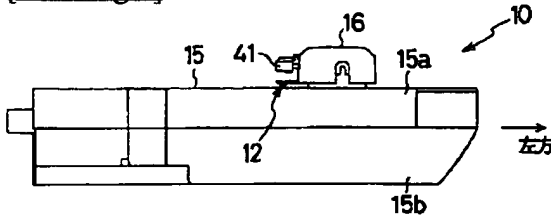
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

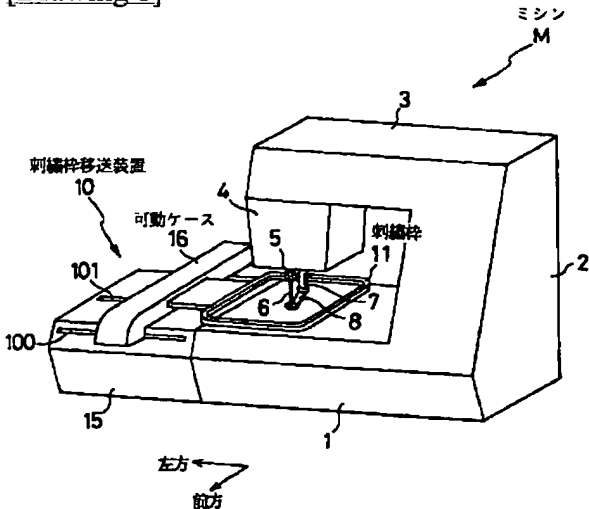
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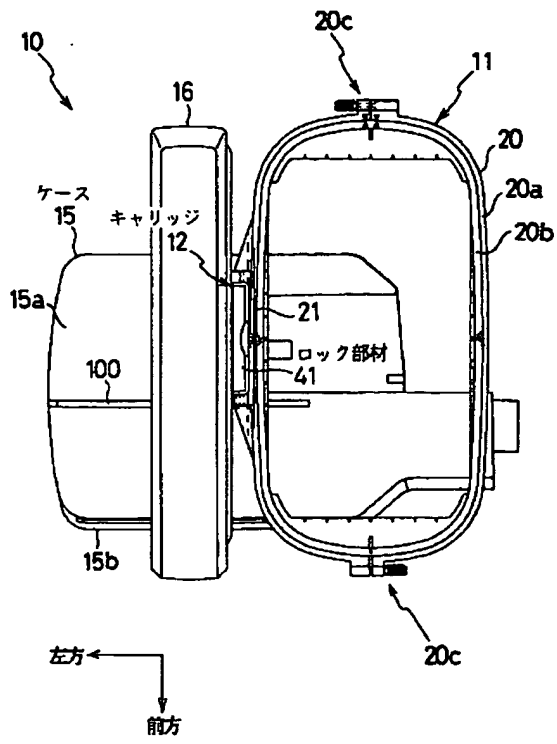
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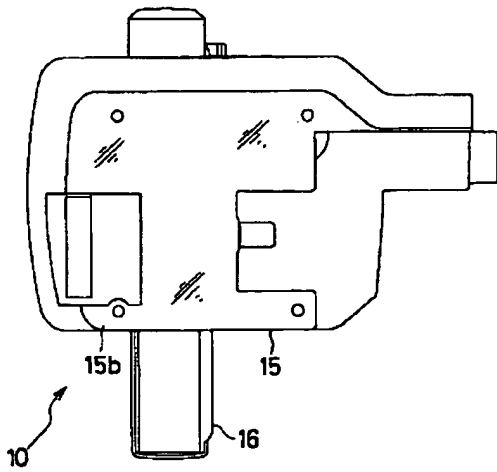
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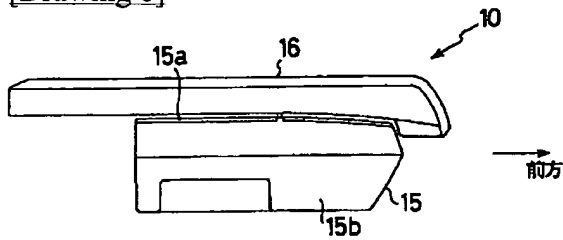
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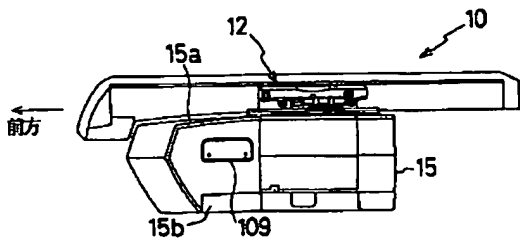
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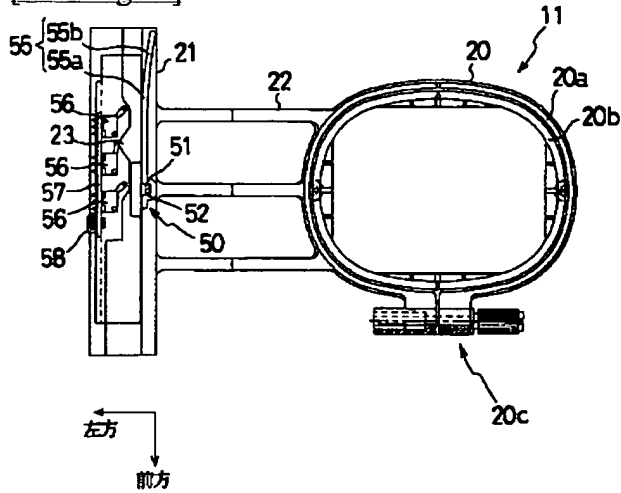
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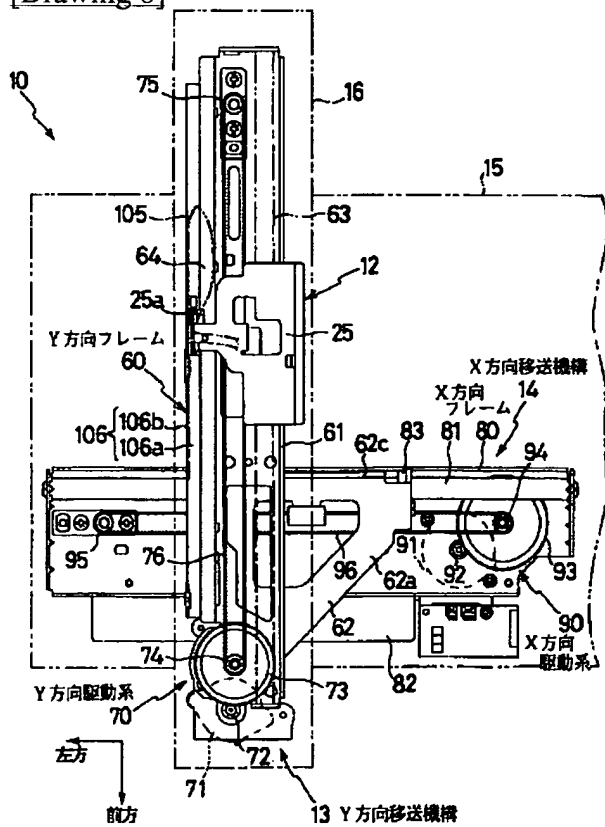
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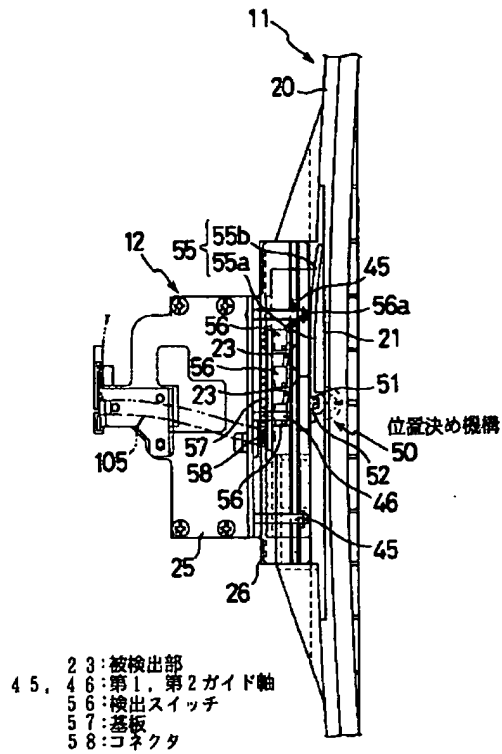
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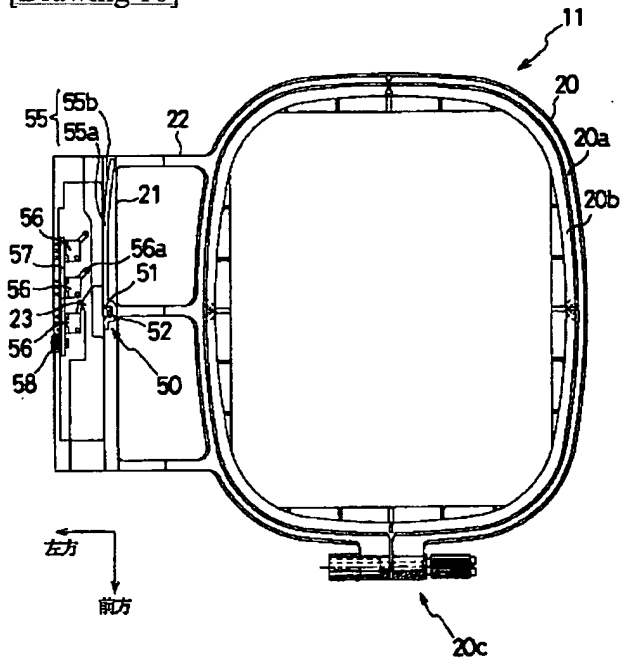
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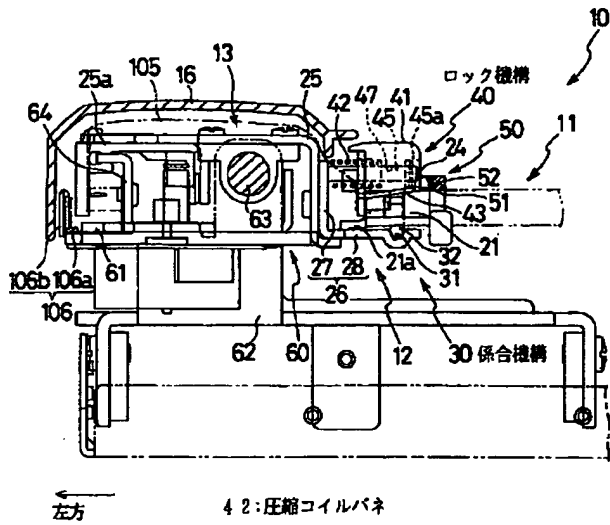
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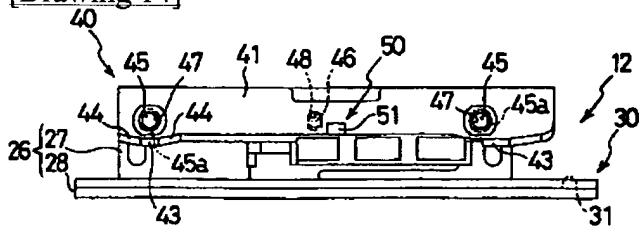
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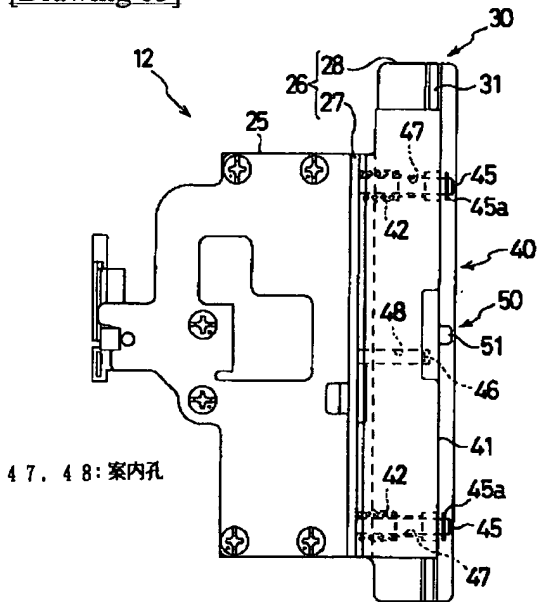
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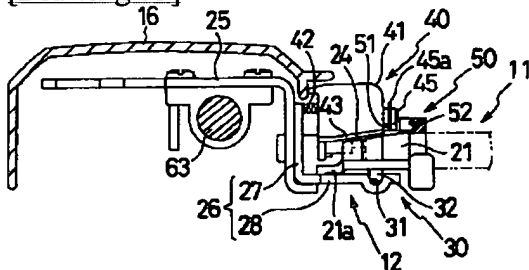
[Drawing 14]



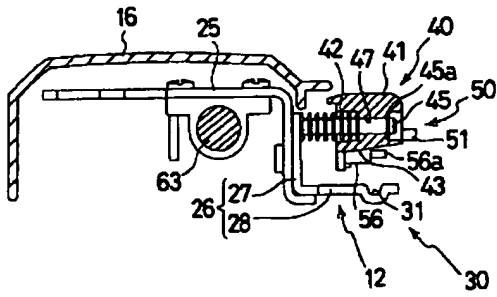
[Drawing 13]



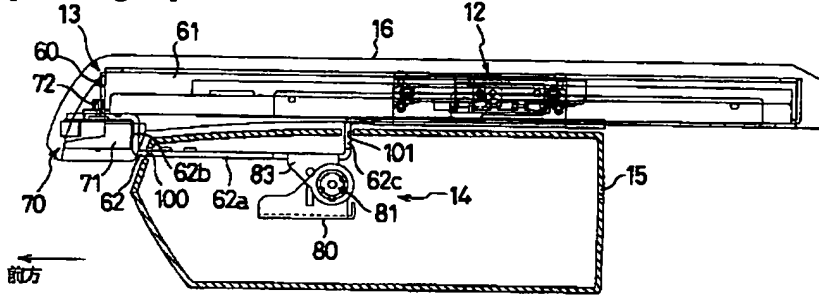
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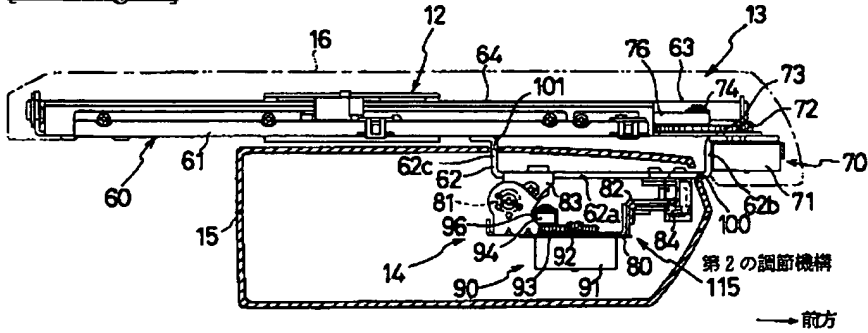
[Drawing 16]



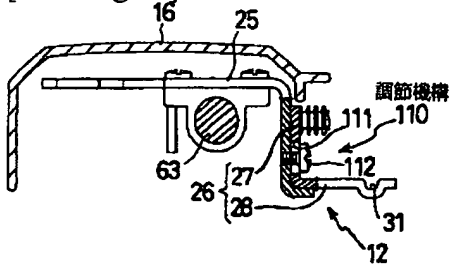
[Drawing 17]



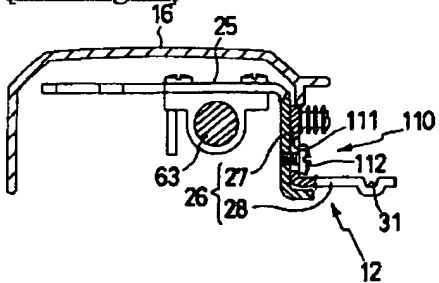
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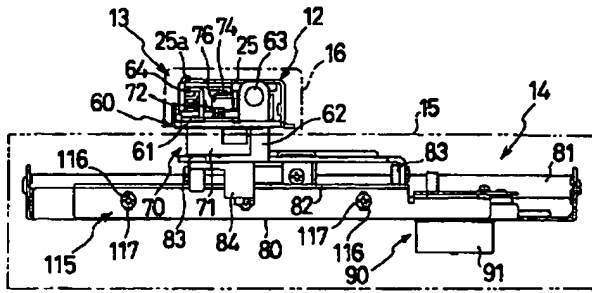
[Drawing 20]



[Drawing 21]

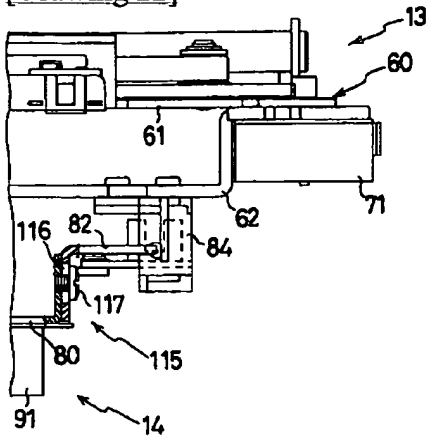


[Drawing 19]

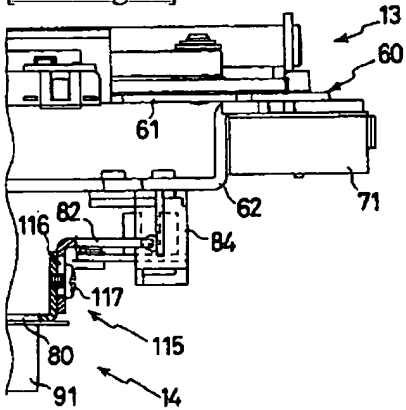


左方

[Drawing 22]



[Drawing 23]



[Translation done.]

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(71) 出願人 000005267

ブラザー工業株式会社

愛知県名古屋市長区瑞穂区苗代町15番1号

(72) 発明者 庄子 善久

名古屋市瑞穂区苗代町15番1号 ブラザー工業株式会社内

(74) 代理人 100089004

弁理士 岡村 俊雄

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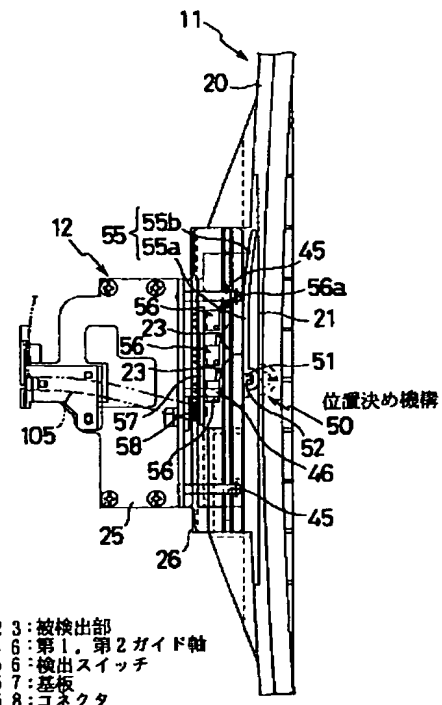
JA33

(54) 【発明の名称】 刺繍枠移送装置

(57) 【要約】

【課題】 キャリッジへの刺繍枠の着脱をスムーズに行い、検出スイッチの劣化を防止して耐久性を向上させ、キャリッジに装着される刺繍枠を誤検出せずに簡単に且つ確実に検出できる刺繍枠移送装置を提供する。

【解決手段】 刺繍枠移送装置10のロック機構40は、刺繍枠11の連結部21をキャリッジ12に押圧する押圧位置と押圧を解除する解除位置とに互って移動自在にキャリッジ12に支持されたロック部材41と、このロック部材41を押圧位置へ付勢する圧縮コイルバネ42を有する。刺繍枠11の連結部21に被検出部23を設け、ロック部材41に被検出部23を検出する検出スイッチ56を設け、ロック部材41を押圧位置に切換えた状態のときだけ、検出スイッチ56で被検出部23を検出可能に構成した。



【特許請求の範囲】

【請求項1】 刺繍枠と、刺繍枠を着脱可能なキャリッジと、キャリッジを直交2方向へ独立に移動させる移送機構を備えた刺繍枠移送装置において、前記キャリッジに検出位置と退避位置とに互って位置切換可能な可動部材を設け、この可動部材に刺繍枠の被検出部を検出する為の検出スイッチを設け、前記可動部材を検出位置に切換えた状態のときだけ検出スイッチで被検出部を検出可能に構成したことを特徴とする刺繍枠移送装置。

【請求項2】 刺繍枠と、刺繍枠を着脱可能なキャリッジと、キャリッジを直交2方向へ独立に移動させる移送機構とを備えた刺繍枠移送装置において、前記キャリッジに刺繍枠の連結部を係脱可能に係合させる係合機構と、この係合機構を介して枠装着位置に係合した刺繍枠の連結部をキャリッジに解除可能にロックするロック機構を設け、このロック機構は、前記連結部をキャリッジに押圧する押圧位置と押圧を解除する解除位置とに互って移動自在にキャリッジに支持された可動部材と、この可動部材を押圧位置へ付勢する付勢部材を有し、前記刺繍枠の連結部に被検出部を設けるとともに可動部材に被検出部を検出する検出スイッチを設け、前記可動部材を押圧位置に切換えた状態のときだけ、検出スイッチで刺繍枠の被検出部を検出可能に構成したことを特徴とする刺繍枠移送装置。

【請求項3】 前記検出スイッチは、被検出部に接触可能な検出レバーを有するオンオフスイッチであり、前記被検出部は、検出レバー側へ突出する突起部からなることを特徴とする請求項1又は2に記載の刺繍枠移送装置。

【請求項4】 前記係合機構は、キャリッジと刺繍枠の連結部の一方に設けられた係合溝と他方に設けられかつ前記係合溝にスライド可能に係合する係合部を有することを特徴とする請求項2に記載の刺繍枠移送装置。

【請求項5】 前記キャリッジに複数の検出スイッチを刺繍枠装着方向に並べて設け、刺繍枠の連結部に1又は複数の検出スイッチに対応する1又は複数の被検出部を設け、この1又は複数の被検出部を刺繍枠の種類毎に固有の配置パターンで配置したことを特徴とする請求項4に記載の刺繍枠移送装置。

【請求項6】 使用頻度の高い刺繍枠に、刺繍枠装着時の進入の際に上流側に位置する検出スイッチに対応する1つの被検出部を設けたことを特徴とする請求項5に記載の刺繍枠移送装置。

【請求項7】 前記可動部材に設けられた突出部と、刺繍枠に設けられ突出部が係脱可能な凹溝とを有し、突出部が凹溝に係合して刺繍枠を前記枠装着位置に位置決めする位置決め機構を設けたことを特徴とする請求項3～6の何れかに記載の刺繍枠移送装置。

【請求項8】 前記係合機構を介して刺繍枠をキャリッジの枠装着位置に装着する際に、可動部材を案内して退避位置又は解除位置に切換えるガイド部を、刺繍枠の連結部又は可動部材に設けたことを特徴とする請求項3～7の何れかに記載の刺繍枠移送装置。

【請求項9】 前記可動部材に複数の検出スイッチを電氣的に接続する基板を設けたことを特徴とする請求項4に記載の刺繍枠移送装置。

【請求項10】 前記刺繍枠移送装置の制御装置に基板の配線を電氣的に接続するコネクタを前記基板に設けたこと特徴とする請求項9に記載の刺繍枠移送装置。

【発明の詳細な説明】**【0001】**

【発明の属する技術分野】 本発明は刺繍枠移送装置に関し、特に、検出位置（押圧位置）と退避位置（解除位置）とに互って位置切換え可能な可動部材に検出スイッチを設け、可動部材を検出位置に切換えた状態のときだけ検出スイッチで刺繍枠の被検出部を検出可能に構成した刺繍枠移送装置に関する。

【0002】

【従来の技術】 従来、一般的な刺繍枠移送装置は、刺繍枠と、刺繍枠を着脱可能なキャリッジと、キャリッジをミシンベッド部の幅方向（Y方向）へ移動させるY方向移送機構と、このY方向移送機構と共にキャリッジをミシンベッド部の長さ方向（X方向）へ移動させるX方向移送機構等を備えている。この刺繍枠移送装置により加工布を取付けた刺繍枠がX方向とY方向へ移送され、その加工布にミシンの縫製機構により縫製が施されて刺繍模様が形成される。

【0003】 Y方向移送機構は、キャリッジをY方向へ移動自在にガイド支持するY方向フレームと、このY方向フレームに装着されてキャリッジをY方向へ駆動するY方向モータを含むY方向駆動系を有し、X方向移送機構は、Y方向フレームの下側に設けられてY方向フレームをX方向へ移動自在にガイド支持するX方向フレームと、このX方向フレームに装着されてY方向フレームをX方向へ駆動するX方向モータを含むX方向駆動系を有する。

【0004】 この種の刺繍枠移送装置では、X方向移送機構をケース部材に収容し、ケース部材の上側にY方向移送機構とキャリッジを配設し、このケース部材をミシンベッド部に着脱可能に構成したものが多い。ケース部材がミシンベッド部に装着されると、刺繍枠移送装置の電気系とミシンの電気系がコネクタを介して接続され、ミシンの制御部によりX方向移送機構とY方向移送機構が駆動制御される。

【0005】 ところで、従来の刺繍枠移送装置において、主に刺繍枠の装着の有無を検出する為の検出スイッチを設けたものが実用に供されている。例えば、前記Y方向フレーム又はケース部材に検出スイッチを固定的に

設け、移送機構を駆動制御してキャリッジを所定の検出位置（例えば、移動限界位置付近）へ移動させ、そのとき、キャリッジに刺繍枠が装着されていると、刺繍枠の被検出部が検出スイッチで検出されるようにした技術は知られている。

【0006】また、キャリッジに検出スイッチを固定的に設け、刺繍枠をキャリッジの枠装着位置に装着すると、刺繍枠の被検出部が検出スイッチで検出されるようにした技術も知られている。この技術においては、刺繍枠の装着の有無だけでなく、キャリッジに複数の検出スイッチを設けるとともに、刺繍枠に1又は複数の検出スイッチに対応する1又は複数の被検出部を設けることにより、これら被検出部の配置パターンで刺繍枠の種類を検出することもできる。

【0007】他方、従来の刺繍枠移送装置において、刺繍枠をキャリッジに着脱する種々の構造が実用化されている。例えば、本願出願人が出願した実用新案登録第2522857号公報では、キャリッジの立壁部に上端から縦長の1対の係合溝が形成され、刺繍枠の連結部に1対の係合溝に対応する1対の係合ピンが設けられ、また、キャリッジには立壁部の上側から刺繍枠側へ張り出した付勢位置で前記連結部を下方へ付勢する板バネが設けられている。

【0008】

【発明が解決しようとする課題】 従来の刺繍枠移送装置において、キャリッジを検出位置へ移動させ、そのときキャリッジに刺繍枠が装着されていると、刺繍枠の被検出部が検出スイッチで検出される技術では、主に刺繍枠の装着の有無を検出する為だけに、キャリッジを検出位置へ移動させなければならない。そして、刺繍縫製を行う前に刺繍枠の装着の有無を確実に検出するためには、縫製開始毎にキャリッジを検出位置へ移動させなければならないため、その為の時間と電力がかかりかなり不利である。

【0009】また、キャリッジに検出スイッチを固定的に設け、刺繍枠をキャリッジの枠装着位置に装着すると、刺繍枠の被検出部が検出スイッチで検出される技術では、検出スイッチが常時刺繍枠の被検出部を検出可能な位置に位置しているため、特に検出スイッチが接触型スイッチ等の場合、刺繍枠をキャリッジに着脱する毎に、その検出スイッチが対応する刺繍枠の被検出部以外の部分に接触して、刺繍枠をスムーズに着脱できないこと、検出スイッチが劣化して耐久性が低下すること、等の虞が生じる。

【0010】しかも、刺繍枠がキャリッジの枠装着位置に完全に装着されていないと、検出スイッチが刺繍枠の被検出部を検出する虞がある。つまり、刺繍枠の枠装着位置への装着が不備であっても、刺繍枠が装着されていると誤検出し、この状態で縫製が行われると、刺繍枠にガタツキが生じて刺繍模様の品質が低下する。

【0011】また、実用新案登録第2522857号公報の刺繍枠移送装置では、製作誤差や組付け誤差等により、キャリッジの1対の係合溝に刺繍枠の1対の係合ピンをガタツキなく係合させることが難しく、特に刺繍枠が移動を開始する際、キャリッジに対して刺繍枠がガタついて位置ずれを起こし、刺繍模様の品質が低下するという問題もある。それ故、高い加工精度や組付け精度が必要となるが、製作コストが高価になる等の不都合が生じる。

【0012】本発明の目的は、刺繍枠移送装置において、刺繍枠の着脱をスムーズに行うこと、検出スイッチの劣化を防止して耐久性を向上させること、キャリッジに装着される刺繍枠を誤検出せずに簡単に且つ確実に検出すること、等である。

【0013】

【課題を解決するための手段】 請求項1の刺繍枠移送装置は、刺繍枠と、刺繍枠を着脱可能なキャリッジと、キャリッジを直交2方向へ独立に移動させる移送機構を備えた刺繍枠移送装置において、前記キャリッジに検出位置と退避位置とに互って位置切換可能な可動部材を設け、この可動部材に刺繍枠の被検出部を検出する為の検出スイッチを設け、前記可動部材を検出位置に切換えた状態のときだけ検出スイッチで被検出部を検出可能に構成したことを特徴とするものである。

【0014】この刺繍枠移送装置は、刺繍枠、キャリッジ、移送機構を備え、刺繍枠をキャリッジに装着し、そのキャリッジを直交2方向へ独立に移動させるものであり、そのキャリッジに取付けた加工布にミシンの縫製機構により縫製が施されて刺繍模様が形成される。キャリッジに検出位置と退避位置とに互って位置切換可能な可動部材が設けられ、この可動部材に刺繍枠の被検出部を検出する為の検出スイッチが設けられ、可動部材を検出位置に切換えた状態のときだけ検出スイッチで被検出部を検出可能に構成されている。

【0015】つまり、可動部材を退避位置に切換えて、検出スイッチで刺繍枠の被検出部を検出不能な状態にして、刺繍枠をキャリッジに着脱し、刺繍枠を枠装着位置に装着した状態で可動部材を検出位置に切換えて、検出スイッチで刺繍枠の被検出部を検出することができる。特に検出スイッチが接触型スイッチの場合、刺繍枠の着脱の際に、その検出スイッチが対応する刺繍枠の被検出部やそれ以外の部分に殆ど接触しないようにして、刺繍枠の着脱をスムーズに行い、検出スイッチの劣化を防止して耐久性を向上させることができる。

【0016】このように、刺繍枠をキャリッジに装着するだけで刺繍枠の被検出部を簡単に検出でき、また、刺繍枠の着脱の際には可動部材を退避位置に保持し、刺繍枠が枠装着位置に装着されると、可動部材を検出位置に切換え可能に構成することで、キャリッジに装着される刺繍枠の被検出部を誤検出せずに確実に検出できるよう

になる。尚、可動部材については、検出スイッチを設ける為だけの部材として設けてもよいし、刺繍枠の連結部をキャリッジに解除可能に押圧してロックするような場合、そのロック部材と共通の部材として設けてもよい。

【0017】請求項2の刺繍枠移送装置は、刺繍枠と、刺繍枠を着脱可能なキャリッジと、キャリッジを直交2方向へ独立に移動させる移送機構とを備えた刺繍枠移送装置において、前記キャリッジに刺繍枠の連結部を係脱可能に係合させる係合機構と、この係合機構を介して枠装着位置に係合した刺繍枠の連結部をキャリッジに解除可能にロックするロック機構を設け、このロック機構は、前記連結部をキャリッジに押圧する押圧位置と押圧を解除する解除位置とに互って移動自在にキャリッジに支持された可動部材と、この可動部材を押圧位置へ付勢する付勢部材を有し、前記刺繍枠の連結部に被検出部を設けるとともに可動部材に被検出部を検出する検出スイッチを設け、前記可動部材を押圧位置に切換えた状態のときだけ、検出スイッチで刺繍枠の被検出部を検出可能に構成したことを特徴とするものである。

【0018】この刺繍枠移送装置は、刺繍枠、キャリッジ、移送機構を備え、刺繍枠をキャリッジに装着し、そのキャリッジを直交2方向へ独立に移動させるものであり、そのキャリッジに取付けた加工布にミシンの縫製機構により縫製が施されて刺繍模様が形成される。係合機構とロック機構が設けられ、係合機構により、キャリッジに刺繍枠の連結部を係脱可能に係合させ、ロック機構により、この係合機構を介して枠装着位置に係合した刺繍枠の連結部をキャリッジに解除可能にロックする。

【0019】ロック機構は可動部材と付勢部材を有し、可動部材は、前記連結部をキャリッジに押圧する押圧位置と押圧を解除する解除位置とに互って移動自在にキャリッジに支持され、付勢部材によりこの可動部材が押圧位置へ付勢されている。そして、刺繍枠の連結部に被検出部が設けられ、可動部材に被検出部を検出する検出スイッチが設けられ、可動部材を押圧位置に切換えた状態のときだけ、検出スイッチで刺繍枠の被検出部を検出可能に構成されている。

【0020】つまり、可動部材を解除位置に切換えて、検出スイッチで刺繍枠の被検出部を検出不能な状態にして、刺繍枠をキャリッジに着脱でき、刺繍枠の連結部を枠装着位置に係合させた状態で可動部材が押圧位置に切換わり、付勢部材の付勢力により前記連結部をキャリッジに押圧しロックすると共に、検出スイッチで刺繍枠の被検出部を検出することができる。特に検出スイッチが接触型スイッチの場合、刺繍枠の着脱の際に、その検出スイッチが対応する刺繍枠の被検出部やそれ以外の部分に殆ど接触しないようにして、刺繍枠の着脱をスムーズに行い、検出スイッチの劣化を防止して耐久性を向上させることができる。

【0021】このように、刺繍枠をキャリッジに装着す

るだけで刺繍枠の被検出部を簡単に検出でき、また、刺繍枠の着脱の際には可動部材を解除位置に保持し、刺繍枠が枠装着位置に装着されると、可動部材を押圧位置に切換え可能に構成することで、キャリッジに装着される刺繍枠の被検出部を誤検出せずに確実に検出できるようになる。また、可動部材により前記連結部をキャリッジに押圧して装着するようにしたので、それ程高い加工精度や組付け精度を必要とせず、製作コストが高価になるのを防止できる。

【0022】請求項3の刺繍枠移送装置は、請求項1又は2の発明において、前記検出スイッチは、被検出部に接触可能な検出レバーを有するオンオフスイッチであり、前記被検出部は、検出レバー側へ突出する突起部からなることを特徴とするものである。刺繍枠を枠装着位置に装着した状態で可動部材が検出位置（押圧位置）に切換えられると、検出スイッチの揺動レバーが刺繍枠の突起部に接触し揺動するため、検出スイッチで刺繍枠の被検出部を確実に検出することができる。

【0023】請求項4の刺繍枠移送装置は、請求項2の発明において、前記係合機構は、キャリッジと刺繍枠の連結部の一方に設けられた係合溝と他方に設けられかつ前記係合溝にスライド可能に係合する係合部を有することを特徴とするものである。キャリッジの係合溝又は係合部を形成する部分に受け止め部を設けることができ、この係合機構を介して係合した前記連結部を前記受け部にロック部材で押圧することができる。刺繍枠の連結部を、キャリッジとロック部材の間においてスライドさせることができるため、刺繍枠の着脱の際、ロック部材を大きく解除位置に退避させる必要がなく、全体的な構造を小型化及び簡単化できる。

【0024】請求項5の刺繍枠移送装置は、請求項4の発明において、前記キャリッジに複数の検出スイッチを刺繍枠装着方向に並べて設け、刺繍枠の連結部に1又は複数の検出スイッチに対応する1又は複数の被検出部を設け、この1又は複数の被検出部を刺繍枠の種類毎に固有の配置パターンで配置したことを特徴とするものである。つまり、キャリッジに装着した刺繍枠の種類を検出できるようになる。しかも、刺繍枠を前記係合機構を介してスライドさせながら装着する際に、検出スイッチが刺繍枠の被検出部に殆ど接触しないように構成することができる。

【0025】請求項6の刺繍枠移送装置は、請求項5の発明において、使用頻度の高い刺繍枠に、刺繍枠装着時の進入の際に上流側に位置する検出スイッチに対応する1つの被検出部を設けたことを特徴とするものである。使用頻度の高い刺繍枠をキャリッジに着脱する際、刺繍枠装着時の進入の際に上流側に位置する検出スイッチ以外の残りの検出スイッチが、前記被検出部に全く接触しないようになるため、前記残りの検出スイッチの劣化により確実に防止して耐久性を向上させることができる。

【0026】請求項7の刺繍枠移送装置は、請求項3～6の何れかの発明において、前記可動部材に設けられた突出部と、刺繍枠に設けられ突出部が係脱可能な凹溝とを有し、突出部が凹溝に係合して刺繍枠を前記枠装着位置に位置決めする位置決め機構を設けたことを特徴とするものである。検出スイッチで被検出部を確実に検出するために、突出部を凹溝に係合させて刺繍枠を枠装着位置に位置決めした状態で、可動部材を検出位置（押圧位置）に切換えることができる。

【0027】請求項8の刺繍枠移送装置は、請求項3～7の何れかの発明において、前記係合機構を介して刺繍枠をキャリッジの枠装着位置に装着する際に、可動部材を案内して退避位置又は解除位置に切換えるガイド部を、刺繍枠の連結部又は可動部材に設けたことを特徴とするものである。刺繍枠が枠装着位置以外に位置する状態において、刺繍枠を着脱する際、可動部材を退避位置又は解除位置に確実に保持することができる。

【0028】請求項9の刺繍枠移送装置は、請求項4の発明において、前記可動部材に複数の検出スイッチを電気的に接続する基板を設けたことを特徴とするものである。複数の検出スイッチに対応する複数の配線を、可動部材に設けた基板を介して纏めて刺繍枠移送装置の制御装置等に接続できるようになる。

【0029】請求項10の刺繍枠移送装置は、請求項9の発明において、前記刺繍枠移送装置の制御装置に基板の配線を電気的に接続するコネクタを前記基板に設けたこと特徴とするものである。基板の配線の刺繍枠移送装置の制御装置への接続と分離を容易に行うことができ、刺繍枠移送装置の組立てやメンテナンス等のときに便利になる。

【0030】

【発明の実施の形態】以下、本発明の実施の形態について図面を参照しながら説明する。本実施形態は、ミシンにより加工布に縫製を施して刺繍模様を形成するために、加工布を取付けた刺繍枠を移送する刺繍枠移送装置に、本発明を適用した場合の例である。尚、図1の前後左右を前後左右として説明する。

【0031】最初にミシンMについて簡単に説明する。図1に示すように、ミシンMは、ベッド部1、脚柱部2、アーム部3、ヘッド部4を有し、ベッド部1に刺繍枠移送装置10が着脱可能に装着される。ヘッド部4に針棒5と押え棒7が上下動可能に支持され、針棒5の下端部に縫針6が装着され、押え棒7の下端部に刺繍用の布押え8が装着されている。ベッド部1の内部に回転釜からなる糸捕捉器（図示略）が設けられ、この糸捕捉器と縫針6とが協働して上糸と下糸を交絡させ加工布に縫目を形成する。

【0032】図示していないが、ミシンMには、ミシンモータ、針棒5を駆動する針棒駆動機構、天秤、天秤を駆動する天秤駆動機構、回転釜を駆動する釜駆動機構等

が設けられている。これら駆動機構は、例えば、ミシンモータの駆動力を針棒5と天秤と回転釜に夫々伝達してそれらを駆動するように構成されている。

【0033】刺繍枠移送装置10について説明する。図1～図8に示すように、刺繍枠移送装置10は、刺繍枠11、刺繍枠11の連結部21を着脱可能なキャリッジ12、キャリッジ12をベッド部1の幅方向である前後方向（Y方向）へ移動させるY方向移送機構13、Y方向移送機構13の下側に配設されてY方向移送機構13と共にキャリッジ12をベッド部1の長さ方向である左右方向（X方向）へ移動させるX方向移送機構14を有する。

【0034】刺繍枠移送装置10は、平滑な上面を有するケース15と、このケース15の上側に配設されて前後方向に細長く且つ前後両端部分がケース15の前後両側へ張出す可動ケース16を有する。

【0035】ケース15は上ケース15aと下ケース15bとで構成され（図2～図7参照）、このケース15にX方向移送機構14が収容され、ケース15の上側にY方向移送機構13の大部分とキャリッジ12が配設されている。可動ケース16はその前端部分よりも後端部分がケース15から大きく張出すように構成され、その可動ケース16にY方向移送機構13とキャリッジ12の一部が収容されている。ケース15がベッド部1に装着され、この状態で、ケース15の上面がベッド部1の上面（ベッド面）と同じ高さになる。

【0036】図2、図9～図11に示すように、刺繍枠11は、加工布を取付ける布取付枠部20と、キャリッジ12に連結される連結部21を有し、この刺繍枠移送装置10には、布取付枠部20の大きさと形状が異なる複数種類の刺繍枠11が着脱可能に設けられている。但し、これら刺繍枠11については同一符号を付して説明する。例えば、図2、図9は布取付枠部20が約160×260（左右方向長さ[mm]×前後方向長さ[mm]）の刺繍枠11、図10は布取付枠部20が約100×100の刺繍枠11、図11は布取付枠部20が約60×40の刺繍枠11である。

【0037】複数種類の刺繍枠11の連結部21は略同じ構造であり、キャリッジ12が原点位置のときに、キャリッジ12に装着されている刺繍枠11の布取付枠部20の中心が一定位置（例えば、縫針6の位置）に位置するように、例えば、図10、図11のような刺繍枠11では、布取付枠部20と連結部21を種々の左右方向長さの繋ぎ部22を介して連結している。布取付枠部20は、外枠20aと内枠20bと締付け機構20cを有し、外枠20aと内枠20bの間に加工布を挟み、締付け機構20cで外枠20aを内枠20bに締付けて加工布を取付ける。

【0038】刺繍枠11の連結部21には、キャリッジ12側の検出スイッチ56により検出可能な被検出部2

3が設けられている。検出スイッチ56はキャリッジ12側に前後方向に並べて3つ設けられ、これら検出スイッチ56に対応させて、刺繍枠11の連結部21に、最大3つの被検出部23を前後に並べて前方位置と後方位置とそれらの間の中間位置とに設けることができるが、刺繍枠11の種類毎に1〜3つの被検出部23が固有の配置パターンで配置されている。

【0039】前記前方位置と中間位置と後方位置のうち、例えば、図9の刺繍枠11には、前方位置と中間位置に2つの被検出部23が設けられ、図10の刺繍枠11には、前方位置に1つの被検出部23が設けられ、図11の刺繍枠11には、中間位置に1つの被検出部23が設けられている。

【0040】図9、図12〜図14に示すように、キャリッジ12は、Y方向移送機構13のY方向フレーム60にガイドされる被ガイド部材25と、この被ガイド部材25の右端部に連結されて刺繍枠11を取付ける取付台26を有する。取付台26は、立壁部27と、立壁部27の下端部から右方へ張出す張出部28を有し、立壁部27が後述の調節機構110（図20、図21参照）を介して被ガイド部材25に連結されている。

【0041】このキャリッジ12には、刺繍枠11の連結部21を前後方向へスライドさせて係脱可能に係合させる係合機構30の係合溝31と、この係合機構30を介して枠装着位置に係合した刺繍枠11の連結部21をキャリッジ12に解除可能にロックするロック機構40が設けられている。

【0042】図12〜図14に示すように、係合機構30は、キャリッジ12の取付台26の張出部28に上側から形成された前後方向に長い係合溝31と、刺繍枠11の連結部21の下端部に形成された前後方向に長い係合部32を有し、この係合部32が係合溝31にスライド可能に係合するように構成されている。係合部32の長さは係合溝31の長さと同じか或いは少し短く、係合部32が係合溝31に係合した状態で、それらの長さ方向中央位置が略一致すると刺繍枠11が枠装着位置に装着される。

【0043】この係合機構30では、例えば、係合溝31の後端部にブロック部材等を嵌合し固定することにより、刺繍枠11をキャリッジ12に前方側からしか係合させることができず、刺繍枠11をキャリッジ12に係合した状態で、刺繍枠11をキャリッジ12から前方側へしか係合解除できないようになっている。

【0044】キャリッジ12の張出部28の係合溝31以外の上面は平滑面に形成され、この張出部28のうち係合溝31よりも左側の上面に、係合機構30を介して係合する連結部21の左端の接触部21aが摺動自在に接触するようになっており、この状態で、次に詳述するロック機構40のロック部材41により、連結部21がキャリッジ12の張出部28に押圧される。

【0045】図12〜図16に示すように、ロック機構40は、刺繍枠11の連結部21をキャリッジ12に押圧する図12の押圧位置（検出位置）と押圧を解除する図15の解除位置（退避位置）に互って位置切換え可能に左右方向へ移動自在にキャリッジ12にガイド支持されたロック部材41（可動部材）と、ロック部材41を押圧位置（右方）へ付勢する付勢部材としてロック部材41の長さ方向（前後）両端付近に対応する位置に設けられた1対の圧縮コイルバネ42を有する。

【0046】ロック部材41は、前後方向長さがキャリッジ12の取付台26の前後方向長さよりも少し短く、張出部28の上側に配設されている。ロック部材41の長さ方向両端付近の下部に1対の摺動部43が設けられ、これら摺動部43が前記枠装着位置の刺繍枠11の連結部21の摺動部24に摺動しつつ係合して連結部21を下側に押圧する。1対の摺動部43は、夫々、刺繍枠11の摺動部24側つまり下方に突出させた突起部に形成され、その下面がロック部材41の移動方向（左右方向）に対して右側程上方へ傾斜したテーパ状に形成されている。

【0047】前側の摺動部（突起部）43の刺繍枠11の装着方向である前後方向両端側に、摺動部43に対して前後に離隔する程上側に位置するように傾斜した1対のテーパガイド部44が形成され、これらテーパガイド部44の下面は、左右方向に対して右側程上方へ傾斜したテーパ状に形成されて摺動部43の同じテーパ状の下面に連なっている。ここで、刺繍枠11の連結部21の摺動部24の上面は、ロック部材41の1対の摺動部43と面接触状に係合するように、左右方向に対して右側程上方へ傾斜したテーパ状に形成されている。

【0048】ロック機構40のロック部材41を押圧位置と解除位置とに移動自在に案内するために、第1、第2ガイド軸45、46が設けられ、これらガイド軸45、46がロック部材41の案内孔47、48に夫々挿通され、第1ガイド軸45とその案内孔47は、刺繍枠11の連結部21のスライド方向である左右方向へのロック部材41の微小移動を許容し、第2ガイド軸46とその案内孔48は、左右方向へのロック部材41の微小移動を禁止し且つ第1、第2ガイド軸45、46の軸心を含む面内でのロック部材41の傾動を許容するように構成されている。

【0049】第1ガイド軸45はロック部材41の長さ方向両端付近に対応する位置に1対設けられ、これら第1ガイド軸45の間の中間位置に第2ガイド軸46が設けられ、これらガイド軸45、46は夫々左端部をキャリッジ25の取付台25の立壁部27に固着して右方向へ延び案内孔47、48を挿通している。前記1対の圧縮コイルバネ42は立壁部27とロック部材41の間において1対の第1ガイド軸45に夫々外装され、3つの検出スイッチ56の配置上、前側の圧縮コイルバネ42

の付勢力よりも後側の圧縮コイルバネ42の付勢力を強力にしてある。

【0050】図13、図14に示すように、第1ガイド軸45が挿通する案内孔47は、左右方向に細長い小判孔であり、第2ガイド軸46が挿通する案内孔48が、上下方向（ガイド軸46の軸心方向と直交し且つ刺繍枠11の連結部21のスライド方向と直交する方向）に細長い小判孔である。圧縮コイルバネ42により右方へ付勢されたロック部材41がガイド軸45、46から抜けないように、1対の案内孔47の右側において1対の第1ガイド軸45の右端部に抜け止めリング45aが外嵌状に装着されている。

【0051】図9～図14に示すように、係合機構30を介して係合した刺繍枠11を前記枠装着位置に位置決めする位置決め機構50が設けられている。この位置決め機構50は、ロック部材41に設けられた突出部51と、刺繍枠11に設けられ突出部51が係脱可能な凹溝52とを有する。突出部50はロック部材41の長さ方向中央の右端部に形成され、凹溝52は刺繍枠11の連結部21において連結部21の長さ方向中央に形成され、この突出部51が凹溝52に係合して刺繍枠11がスライド不能にロックされて枠装着位置に位置決めされる。

【0052】また、図9～図11に示すように、係合機構30を介して刺繍枠11をキャリッジ12の枠装着位置に装着する際に、ロック部材41を案内して解除位置に切り替えるガイド部55が、刺繍枠11に設けられている。このガイド部55は、刺繍枠11の連結部21において、連結部21の長さ方向中央からその後半部に互って形成され、その長さ方向前部の直線ガイド部55aと、長さ方向後部に位置して直線ガイド部55aの後端から緩やかに右方へ湾曲する湾曲ガイド部55bを有し、ガイド部55の左面前端は前記凹溝52の左後端に連なっている。

【0053】図9～図11に示すように、ロック部材41には、刺繍枠11の被検出部23を検出する3つの検出スイッチ56が前後方向に並べられ、ロック部材41の長さ方向ほぼ中心位置に対して後側へ偏った状態で設けられ、ロック部材41が押圧位置に切り換えられた状態のときだけ、検出スイッチ56で刺繍枠11の被検出部23を検出可能に構成してある。各検出スイッチ56は、被検出部23に接触可能な検出レバー56aを有するオンオフスイッチであり、前記被検出部23は検出レバー56a側つまり左側へ突出する突起部からなり、前述のように、各刺繍枠11において、この1～3の被検出部23を刺繍枠11の種類毎に固有の配置パターンで配置されている。

【0054】図10の布取付枠部20の大きさが約100×100の刺繍枠11を使用頻度の最も高い刺繍枠11とすると、この使用頻度の高い刺繍枠11には、刺繍枠装

着時の進入の際に上流側に位置する（最も前方に位置する）検出スイッチ56に対応する1つの被検出部23が設けられている。尚、3つの検出スイッチ56を設けたことにより、刺繍枠11の装着の有無と装着される7種類の刺繍枠11を検出可能となる。

【0055】ロック部材41には前後方向に細長い基板57が固定的に設けられ、この基板57に3つの検出スイッチ56が固定されると共に電氣的に接続されている。そして、この基板57には、基板57の配線を電氣的に接続するコネクタ58が設けられ、このコネクタ58から各検出スイッチ56の配線を含む共通の配線コード105（図9、図12参照）が延びている。

【0056】ここで、キャリッジ12への刺繍枠11の着脱について説明する。図16に示すように、キャリッジ12に刺繍枠11を装着していない状態では、圧縮コイルバネ42により右方へ付勢されたロック部材41が、抜け止めリング45aに係止されて右限界位置に位置している。この状態から、キャリッジ12の張出部28とロック部材41の間に、刺繍枠11の連結部21を前側から挿入するように連結部21の係合部32を係合溝31に係合させて、連結部21を後方へスライドさせる。

【0057】その際、連結部21のガイド部55の前端部が、右限界位置に位置するロック部材41の突出部51の右端よりも右側に位置するため、後方へ移動するガイド部55が突出部51と衝突することなく、湾曲ガイド部55bが突出部51に係合して突出部51を左側へ押動してロック部材41を解除位置に切り換え、直線ガイド部55aが突出部51に係合してロック部材41を解除位置に保持する。このとき、ロック部材41は、第1、第2ガイド軸45、46の軸心を含む面内で傾動しながら解除位置にスムーズに切り換わる。

【0058】尚、連結部21のガイド部55の前端部が、右限界位置に位置するロック部材41の突出部51の右端よりも左側に位置していても、その後、突出部51の右端よりも右側に位置するようにして突出部51に係合できるように、ガイド部55がロック部材41に直接係合して、ロック部材41を左方へ押動するように構成できる。この場合も、第1、第2ガイド軸45、46の軸心を含む面内で傾動しながら左方へスムーズに移動する。

【0059】ガイド部55に突出部51に係合させロック部材41が解除位置に切り変わった状態で、連結部21を後方へ更にスライドさせ、突出部51と凹溝52の前後方向位置が一致して、刺繍枠11が枠装着位置に達する。すると、圧縮コイルバネ42の付勢力によりロック部材41が右方へ移動し、突出部51が凹溝52に係合すると共に、ロック部材41の1対の摺動部43が、連結部21の1対の摺動部24に摺動しつつ係合して連結部21をキャリッジ12に押圧しロックする。

【0060】尚、作業者がロック部材41を手動で解除位置に切換えた状態で、刺繍枠11の連結部21を枠装着位置に装着してから、ロック部材41から手を離し、そのロック部材41で連結部21をロックする手順で行うことも勿論可能である。また、刺繍枠11をキャリッジ12から取外す場合には、図15に示すように、作業者がロック部材41を手動で解除位置に切換えて、突出部51と凹溝52の係合を解除させ、刺繍枠11を前方へスライドさせて取外す。

【0061】図8、図17～図19に示すように、Y方向移送機構13は、キャリッジ12を前後方向へ移動自在にガイド支持するY方向フレーム60と、このY方向フレーム60に装着されてキャリッジ12を前後方向へ駆動するY方向駆動系70を有する。

【0062】Y方向フレーム60は、前後方向に長いY方向フレーム本体61と、その下側に配設されY方向フレーム本体61に前後両端部で固定された補助フレーム62を有し、補助フレーム62の下部がケース15に収容され、ケース15の上側に補助フレーム62の上部とY方向フレーム本体60が配設されている。Y方向フレーム本体60には、キャリッジ12を前後方向へ案内する前後方向に長い案内軸63とこの案内軸63に対して左右方向へ離隔した位置に案内部材64が設けられている。

【0063】案内軸63はY方向フレーム本体61の右部に配設され、案内軸63の両端部が、Y方向フレーム本体61の前後両側壁に固着され、案内部材64はY方向フレーム本体61の左部に配設され、Y方向フレーム本体61の底部に固定されて上方へ立上がり左方へ屈曲した形状である。そして、キャリッジ12の被ガイド部材25が案内軸63に摺動自在に外嵌され、被ガイド部材25の左端のコ字形の係合部25aが案内部材64の上端部に左側から摺動自在に係合している。

【0064】Y方向駆動系70は、Y方向電動モータ71、駆動ギア72、大径ギア73、1対のプーリ74、75、タイミングベルト76を有し、Y方向電動モータ71の駆動力をキャリッジ12に伝達して、キャリッジ12を前後方向へ駆動する。Y方向電動モータ71は、可動ケース16のケース15の前後両側へ張出した前後両端部分のうち張出し量が小さい方に、つまり前端部分に配設されて、Y方向フレーム本体61の底部の前端下面に上向きにして固定され、その底部の上側へ挿通するY方向電動モータ71の出力軸に駆動ギア72が固着されている。

【0065】Y方向フレーム本体61の前部に、同軸上に固着された大径ギア73とプーリ74が回転自在に枢支され、その大径ギア73に駆動ギア72が噛合している。Y方向フレーム本体61の後部にプーリ75が回転自在に枢支され、これらプーリ74、75に無端状のタイミングベルト76が掛装されている。タイミングベル

ト76は、案内軸63と案内部材64の間に配設され、その一部がキャリッジ12に連結されている。

【0066】X方向移送機構14は、Y方向フレーム60の下側に設けられてY方向フレーム60を左右方向へ移動自在にガイド支持するX方向フレーム80と、このX方向フレーム80に装着されてY方向フレーム60を左右方向へ駆動するX方向駆動系90を有する。X方向フレーム80には、Y方向フレーム60を左右方向へ案内する左右方向に長い案内軸81とこの案内軸81に対して前後方向へ離隔した位置に案内部材82（ガイド部）が設けられている。

【0067】案内軸81はX方向フレーム80の後部に配設され、案内軸81の両端部が、X方向フレーム80の左右両側壁部に固着され、案内部材82はX方向フレーム80の前部に配設され、X方向フレーム80の前側壁に固定されて前方へ延びている。Y方向フレーム60の補助フレーム62に、案内軸81にガイドされる1対の被案内部83と、この被案内部83に対して前後方向へ離隔した位置において前記案内部材82に前側から摺動自在に係合してガイドされるコの字形の係合部84が設けられている。1対の被案内部83はある程度左右方向へ相離隔した位置に設けられている。

【0068】X方向駆動系90は、X方向電動モータ91、駆動ギア92、大径ギア93、1対のプーリ94、95、タイミングベルト96を有し、X方向電動モータ91の駆動力を補助フレーム62に伝達して、Y方向フレーム60を左右方向へ駆動する。X方向電動モータ91は、X方向フレーム80の底部の右下面に上向きにして固定され、その底部の上側へ挿通するX方向電動モータ91の出力軸に駆動ギア92が固着されている。

【0069】X方向フレーム80の右部に、同軸上に固着された大径ギア93とプーリ94が回転自在に枢支され、その大径ギア93に駆動ギア92が噛合している。X方向フレーム80の左部にプーリ95が回転自在に枢支され、これらプーリ94、95に無端状のタイミングベルト96が掛装されている。タイミングベルト96は、案内軸81と案内部材82の間に配設され、その一部が補助フレーム62に連結されている。

【0070】図8、図17、図18に示すように、Y方向フレーム60の補助フレーム62は、平面視にて略逆三角形のベース部62aと、ベース部62aの前後両端から上方へ立上がるように一体形成された立上部62b、62cを有し、側面視にて凹状に形成されている。

【0071】図1、図17、図18に示すように、ケース15の上壁と側壁に左右方向に長い1対のスリット100,101が形成され、補助フレームのうち、ベース部62aの前端部がスリット100を移動自在に挿通し、立上部62cがスリット101を移動自在に挿通している。このように、ケース15の上壁と側壁にスリット100,101を形成したので、ケース15内に糸くずや布くず等のゴミ

やホコリが侵入するのを極力防止することができる。
尚、立上部 62b, 62c の上端部分が Y 方向フレーム本体 61 に連結され、ベース部 62a の後部下側に 1 対の被案内部 83 が設けられ前部下側に係合部 84 が設けられている。

【0072】図 8、図 12 に示すように、Y 方向フレーム 60 の Y 方向フレーム本体 61 の左端部に、検出スイッチ 56 からケース 15 内に延びる配線コード 105 の大部分を支持して前後方向に沿って案内する前後方向に長いコード支持部 106 が設けられ、このコード支持部 106 は、底壁 106a と底壁 106a の左側から立上がる側壁 106b を有し、配線コード 105 を底壁 106a で支持し、底壁 106a で支持された配線コード 105 を側壁 106b で前後方向に沿って案内して底壁 106a からの脱落を防止する。

【0073】図 8、図 9、図 12 に示すように、配線コード 105 は可撓性のある带状コードであり、基板 57 のコネクタ 58 から延びるこの配線コード 105 は、可動ケース 16 内においてキャリッジ 12 の上側を通り、Y 方向フレーム本体 61 の案内部材 64 まで案内され、そこから縦向きになって底壁 106a で支持される。キャリッジ 12 を離れた配線コード 105 は底壁 106a で支持されつつ、例えば、先ず案内部材 64 に沿って後方へ延びてから U ターンして側壁 106b に沿って前方へ延びる。

【0074】このようにしてケース 15 の上壁のスリット 100 の上側位置まで案内された配線コード 105 は下向きに向きを変え、Y 方向フレーム本体 61 から延びるその配線コード 105 を、ケース 15 の上壁のスリット 100 を挿通する補助フレーム 62 に沿ってケース 15 内に案内するようにしてある。また、図示していないが、Y 方向フレーム本体 61 に設けられてキャリッジ 12 を前後方向へ駆動する Y 方向電動モータ 71 から延びるコードを、ケース 15 の側壁のスリット 101 を挿通する補助フレーム 62 に沿ってケース 15 内に案内するようになっている。

【0075】図 7 に示すように、ケース 17 の右端部にコネクタ 109 が設けられ、このコネクタ 109 に、前記配線コード 105、Y 方向電動モータ 71 から延びるコード、X 方向電動モータ 91 から延びるコードが接続され、ケース 15 がベッド部 1 に装着されると、コネクタ 109 がベッド部 1 の左端部に設けたコネクタ（図示略）に接続されて、前記コードがミシン M の制御装置や電源に電氣的に接続される。

【0076】さて、図 20、図 21 に示すように、キャリッジ 12 の被ガイド部材 25 に対して取付台 26 の高さ位置を調節する調節機構 110 が設けられている。この調節機構 110 は、取付台 26 の立壁部 27 に形成された高さ方向に細長い長孔 111 と、この長孔 111 に挿通して被ガイド部材 25 と取付台 26 を解除可能に締結するネジ部材 112 を有する。

【0077】ネジ部材 112 を緩めて被ガイド部材 25 と

取付台 26 の締結を解除した状態で、長孔 111 に対してネジ部材 112 をガイドさせつつ取付台 26 を昇降させて高さ調節を行うことができ、高さ位置調節後にネジ部材 112 を締めて被ガイド部材 25 と取付台 26 を締結し刺繍枠 11 の高さ位置を固定することができる。

【0078】また、図 18、図 19、図 22、図 23 に示すように、Y 方向フレーム 60 のうち案内部材 82 を介して支持される部分の高さ位置を調節して、Y 方向フレーム 60 を案内軸 81 回りに回転させる第 2 の調節機構 115 が設けられている。この第 2 の調節機構 115 は、案内部材 82 に形成された高さ方向に細長い複数の長孔 116 と、これら長孔 116 に夫々挿通して X 方向フレーム 80 と案内部材 82 を解除可能に締結する複数のネジ部材 117 を有する。

【0079】複数のネジ部材 117 を緩めて X 方向フレーム 80 と案内部材 82 の締結を解除した状態で、長孔 116 に対してネジ部材 117 をガイドさせつつ案内部材 82 と一体的に Y 方向フレーム 60 を昇降させてキャリッジ 12 つまり刺繍枠 11 の姿勢を調節することができ、姿勢調節後にネジ部材 117 を締めて X 方向フレーム 80 と案内部材 82 を締結して刺繍枠 11 の姿勢を固定できる。

【0080】上記刺繍枠移送装置 10 の作用・効果について説明する。ロック機構 40 は、刺繍枠 11 の連結部 21 をキャリッジ 12 に押圧する押圧位置と押圧を解除する解除位置とに互って移動自在にキャリッジ 12 に支持されたロック部材 41 と、このロック部材 41 を押圧位置へ付勢する圧縮コイルバネ 42 とを有し、ロック機構 40 において、ロック部材 41 の摺動部 43 を連結部 21 の摺動部 24 側の下側に突出させ、これら摺動部 24、43 を、ロック部材 41 の移動方向に対して傾斜したテーパ状に形成した。

【0081】従って、圧縮コイルバネ 42 の付勢力を比較的弱い付勢力に設定しても、その付勢力がロック部材 41 の摺動部 43 から連結部 21 の摺動部 24 に倍力されて伝達されるため、係合機構 30 を介して係合した刺繍枠 11 の連結部 21 をロック部材 41 によりキャリッジ 12 に強力で押し込み確実にロックできる。

【0082】即ち、摺動部 24、43 をテーパ形状としたので、圧縮コイルバネ 42 の付勢力がロック部材 41 の摺動部 43 を介して連結部 21 に対して下方及び右方の 2 方向に伝達されて、連結部 21 がキャリッジ 12 に強力で押し込まれる。特に、圧縮コイルバネ 42 の付勢力を、ロック部材 41 の摺動部 43 から連結部 21 の摺動部 24 に対して前記 2 方向に伝達できるため、連結部 21 の下端部に設けられた係合部 32 がキャリッジ 12 の係合溝 32 の内面に対して前記 2 方向の力で押し込まれ、これにより、圧縮コイルバネ 42 の付勢力を比較的弱い付勢力に設定しても、連結部 21 をキャリッジ 12 に強力でロックできるようになる。

【0083】それ故、作業者がロック部材41を比較的弱い力で操作して解除位置に移動させることもでき、ロック部材41を解除位置に移動させた状態で行う刺繍枠11の着脱作業を容易に行うことが可能になる。特に、摺動部43を、ロック部材41の長さ方向両端付近に1対設けたので、ロック部材41の1対の摺動部43を連結部21の摺動部24に確実に接触させて、連結部21をキャリッジ12に確実に押圧してロックできるようになる。

【0084】ロック部材41の突起部である摺動部43の前後方向両端側にテーパガイド部44を形成したので、キャリッジ12に刺繍枠11が装着されていない状態で、ロック部材41が押圧位置よりも解除位置と反対側方向へ位置する場合、刺繍枠11をキャリッジ12に装着する際、刺繍枠11の連結部21がテーパガイド部44にガイドされて、連結部21が摺動部43に引っ掛かるのを防止でき、また、ロック部材41を直接操作して解除位置に切換えなくても刺繍枠11をキャリッジ12に装着できる。

【0085】ロック機構40は、キャリッジ12に設けられ且つロック部材41の案内孔47、48に夫々挿通されてロック部材41を押圧位置と解除位置とに移動自在に案内すると第1、第2ガイド軸45、46を有し、第1ガイド軸45とその案内孔47は、左右方向へのロック部材41の微小移動を許容すると共に、第2ガイド軸46とその案内孔48は、左右方向へのロック部材41の微小移動を禁止し且つ第1、第2ガイド軸45、46の軸心を含む面内でのロック部材41の傾動を許容するように構成した。

【0086】従って、ロック部材41が第1、第2ガイド軸45、46を介して押圧位置と解除位置とに互って移動する際、ロック部材41が、第1、第2ガイド軸45、46の軸心を含む面内で傾動して、ガイド軸45、46に対してこじれる虞がなく、移動不能にロックする虞もなくなる。つまり、ロック部材41を押圧位置と解除位置とに互ってスムーズに確実に切換えることができ、左右方向に対する案内孔47、48の加工精度とガイド軸45、46の組付け精度を緩和することができる。

【0087】第2ガイド軸46が挿通する案内孔48が、第2ガイド軸46の軸心方向と直交し且つ前記連結部21のスライド方向と直交する上下方向に細長い小判孔であるので、第1ガイド軸45を案内孔47に挿通させた状態で、第2ガイド軸46を案内孔48に挿通させるように組付け易くなり、案内孔47、48の加工精度とガイド軸45、46の組付け精度を緩和できる。

【0088】刺繍枠11の連結部21に被検出部23を設けるとともにロック部材41に被検出部23を検出する検出スイッチ56を設け、ロック部材41を押圧位置に切換えた状態のときだけ、検出スイッチ56で刺繍枠

11の被検出部23を検出可能に構成した。従って、刺繍枠11の着脱の際に、その検出スイッチ56が対応する刺繍枠11の被検出部23やそれ以外の部分に殆ど接触しないようにして、刺繍枠11の着脱をスムーズに行い、検出スイッチ56の劣化を防止して耐久性を向上させることができる。

【0089】しかも、刺繍枠11の着脱の際にはロック部材41を解除位置に保持し、刺繍枠11が枠装着位置に装着されると、ロック部材41を押圧位置に切換えるように構成したので、キャリッジ12に装着される刺繍枠11の被検出部23を誤検出せずに確実に検出できる。キャリッジ12に3つの検出スイッチ56を前後方向に並べて設け、刺繍枠11の連結部21に1～3つの検出スイッチ56に対応する1～3つの被検出部23を設けたので、1～3つの被検出部23を刺繍枠11の種類毎に固有の配置パターンで配置して、キャリッジ12に装着した刺繍枠11の種類を検出できるようになる。

【0090】使用頻度の高い刺繍枠11に、刺繍枠装着時の進入の際に上流側に位置する検出スイッチ56に対応する1つの被検出部23を設けたので、使用頻度の高い刺繍枠11をキャリッジ12に着脱する際、前記1つの検出スイッチ56以外の残りの検出スイッチ56が、前記1つの被検出部23に全く接触しないようになるため、残りの検出スイッチ56の劣化をより確実に防止して耐久性を向上させることができる。

【0091】3つの検出スイッチ56がロック部材41の長さ方向ほぼ中心位置に対して後側に偏った状態で設けられ、その後側の圧縮コイルバネ42を前側の圧縮コイルバネ42の付勢力よりも強力にしたので、ロック部材41が押圧位置に切換えられて刺繍枠11の被検出部23を確実に検出できると共に、1対の圧縮コイルバネ42によりロック部材41を押圧位置に略全体的にバランスの取れた状態で付勢し、刺繍枠11の連結部21をキャリッジ12に安定的にロックできる。

【0092】即ち、3つの検出スイッチ56をロック部材41の長さ方向中心に対して後側に偏った状態に設けると、検出スイッチ56が刺繍枠11の被検出部23を検出する際に解除位置方向への検出負荷を受け、その力はロック部材41の長さ方向中心に対して後側に偏って作用する。それ故、後側の圧縮コイルバネ42を前側の圧縮コイルバネ42の付勢力よりも強力にすることにより、ロック部材41を押圧位置に略全体的にバランスの取れた状態で付勢して、刺繍枠11の連結部21をキャリッジ12に安定的に確実にロックできる。つまり、3つの検出スイッチ56をロック部材41の長さ方向中心に対して偏った状態に問題なく設けることが可能となる。

【0093】ロック部材41に設けられた突出部51と、刺繍枠11に設けられ突出部51に係脱可能な凹溝52とを有し、突出部51が凹溝52に係合して刺繍枠

11を前記枠装着位置に位置決めする位置決め機構50を設けたので、検出スイッチ56で被検出部23を確実に検出する為に、突出部51を凹溝52に係合させて刺繍枠11を枠装着位置に位置決めした状態で、ロック部材41を押圧位置に確実に切換えることができる。

【0094】係合機構30を介して刺繍枠11をキャリッジ12の枠装着位置に装着する際に、ロック部材41を案内して退避位置に切換えるガイド部55を、刺繍枠11の連結部21に設けたので、刺繍枠11が枠装着位置以外に位置する状態において、刺繍枠11を着脱する際、ロック部材41を解除位置に確実に切換えて保持することができる。

【0095】ロック部材41に3つの検出スイッチ56を電氣的に接続する基板57を設けたので、3つの検出スイッチ56に対応する配線を、基板57を介して纏めて配線コード105で制御装置等に接続できる。しかも、基板57の配線を電氣的に接続するコネクタ58を前記基板57に設けたので、基板57の配線の接続と分離を容易に行うことができ、刺繍枠移送装置10の組立てやメンテナンス等のときに便利になる。

【0096】検出スイッチ56からケース15内に延びる配線コード105の大部分を支持して前後方向に沿って案内するコード支持部106を、Y方向フレーム本体61に設けたので、前後方向へ移動するキャリッジ12の検出スイッチ56からケース12内に延びる配線コード105を、整然と配設しケース15内に確実に案内することができ、Y方向フレーム60を可動ケース16でカバーして、その可動ケース16内に配線コード105の大部分を収容できるため、配線コード105にホコリやゴミが付着するのを防止できる。

【0097】X方向フレーム80に左右方向に長くかつ前後方向に相離隔した位置に案内軸81及びガイド部材82を設け、Y方向フレーム60は、前後方向に長いY方向フレーム本体61とその下側に配設されY方向フレーム本体61に両端部で固定された補助フレーム62を有し、この補助フレーム62に、案内軸81にガイドされる被案内部83と、この被案内部83に対してY方向へ離隔した位置においてガイド部材82でガイドされる係合部84を設けた。

【0098】このように、Y方向フレーム本体61に補助フレーム62の両端部を固定し、この補助フレーム62の前後方向へ離隔した被案内部83と係合部84を、X方向フレーム80の案内軸81とガイド部材82でガイド支持するため、X方向フレーム80にY方向フレーム60を安定した状態で左右方向へ移動自在にガイド支持することができ、しかも、補助フレーム62の被案内部83と係合部84を前後方向へ比較的接近させて設けることができ、これにより、移送機構13、14の構造を簡単化でき製作コストを低減することができる。

【0099】ケース15の上側に配設されてY方向移送

機構13を収容する可動ケース16を、ケース15の前後両側へ張出するように構成し、この可動ケース15のケース15の前後両側へ張出した前後両端部分のうち張出し量が小さい前端部分に、Y方向電動モータ71を配設した。従って、キャリッジ16の前後方向の移動ストロークを大きくとることができると共に、Y方向電動モータ71を可動ケース16の内部に配設したことにより、ケース15にY方向電動モータ71の出力軸が挿通するスリットを形成しなくてもよくなりケース15の構造が簡単化し、ケース15内にゴミや埃等も入りにくくなり、更に、Y方向電動モータ71の出力軸が外部に露出しなくなるため、その出力軸に係が絡まる虞もなくなる。

【0100】そして、キャリッジ12が後側へ大きく移動した際、可動ケース16の張出し量が小さい前端部分にY方向電動モータ71を配設しているので、刺繍枠11（加工布）を取付けたキャリッジ12とY方向移送機構13の全体的な重心が後側に偏り過ぎるのを防止して重量バランスをとることができ、キャリッジ12と刺繍枠11を安定した姿勢でガタツキなく移動させることができる。また、可動ケース16の前端部分よりも後端部分をケース15から大きく張出するようにして、キャリッジ12を前方よりも後方に大きく移動させるように構成できるため、刺繍枠移送装置10の前側から作業する作業者の邪魔になるのを極力防止できる。

【0101】前記刺繍枠移送装置10の変形態態について説明する。

1) 刺繍枠11の摺動部24とロック部材41の摺動部43の一方だけを、ロック部材41の移動方向に対して傾斜したテーパ状に形成してもよい。

2) 摺動部43の左右両端側の少なくとも1つのテーパガイド部44を省略することが可能である。

【0102】3) 係合機構30において、ロック部材41に係合溝を設け、この係合溝にスライド可能に係合する係合部をキャリッジ12に設けてもよい。

4) 位置決め機構50において、刺繍枠11に突出部を設け、この突出部が係脱可能な凹溝をロック部材41に設けてもよい。

【0103】5) キャリッジ12に2つ又は4つ以上の複数の検出スイッチ56を設け、刺繍枠の連結部に1又は複数の検出スイッチ56に対応する1又は複数の被検出部を設けてもよい。検出スイッチ56の数がn個の場合、 $(2^n - 1)$ 種類の刺繍枠11を検出することが可能となる。尚、刺繍枠11の装着の有無だけを検出する場合には、1つの検出スイッチ56を設けるだけでよい。

6) ロック機構40において、1又は3つ以上の第1ガイド軸とその案内孔を設けてもよい。

【0104】7) 調節機構110において、被ガイド部材25に上下方向に細長い長孔を形成し、この長孔にネジ

部材を挿通させて被ガイド部材25と取付台26とを解除可能に締結するようにしてもよい。

8) 第2の調節機構115において、X方向フレーム80に上下方向に細長い複数の長孔を形成し、これら長孔に複数のネジ部材を夫々挿通させてX方向フレーム80と案内部材82を解除可能に締結するようにしてもよい。

【0105】9) ロック部材41を一体のものでなく複数の部材で構成してもよい。

10) 摺動部43をロック部材41の両端部以外の位置に設けてもよいし、摺動部43を1対ではなく3つ以上設けてもよい。

【0106】尚、本発明の趣旨を逸脱しない範囲で、前記変更形態以外の種々の変更を付加した形態で実施することも可能である。

【0107】

【発明の効果】 請求項1の刺繍枠移送装置によれば、キャリッジに検出位置と退避位置とに互って位置切換可能な可動部材を設け、この可動部材に刺繍枠の被検出部を検出する為の検出スイッチを設け、前記可動部材を検出位置に切換えた状態のときだけ検出スイッチで被検出部を検出可能に構成した。従って、刺繍枠の着脱の際に、その検出スイッチが対応する刺繍枠の被検出部やそれ以外の部分に殆ど接触しないようにして、刺繍枠の着脱をスムーズに行い、検出スイッチの劣化を防止して耐久性を向上させることができる。しかも、刺繍枠の着脱の際には可動部材を退避位置に保持し、刺繍枠が枠装着位置に装着されると、可動部材を検出位置に切換え可能に構成することで、キャリッジに装着される刺繍枠の被検出部を誤検出せずに確実に検出できるようになる。

【0108】請求項2の刺繍枠移送装置によれば、キャリッジに刺繍枠の連結部を係脱可能に係合させる係合機構と、この係合機構を介して枠装着位置に係合した刺繍枠の連結部をキャリッジに解除可能にロックするロック機構を設けた。そして、ロック機構は、前記連結部をキャリッジに押圧する押圧位置と押圧を解除する解除位置とに互って移動自在にキャリッジに支持された可動部材と、この可動部材を押圧位置へ付勢する付勢部材を有し、前記連結部に被検出部を設けるとともに可動部材に被検出部を検出する検出スイッチを設け、可動部材を押圧位置に切換えた状態のときだけ、検出スイッチで刺繍枠の被検出部を検出可能に構成した。

【0109】従って、刺繍枠の着脱の際に、その検出スイッチが対応する刺繍枠の被検出部やそれ以外の部分に殆ど接触しないようにして、刺繍枠の着脱をスムーズに行い、検出スイッチの劣化を防止して耐久性を向上させることができる。しかも、刺繍枠の着脱の際には可動部材を解除位置に保持し、刺繍枠が枠装着位置に装着されると、可動部材を押圧位置に切換え可能に構成することで、キャリッジに装着される刺繍枠の被検出部を誤検出せずに確実に検出でき、更に、可動部材により前記連結

部をキャリッジに押圧して装着するようにしたので、それ程高い加工精度や組付け精度を必要とせず、製作コストが高価になるのを防止できる。

【0110】請求項3の刺繍枠移送装置によれば、検出スイッチは、被検出部に接触可能な検出レバーを有するオンオフスイッチであり、前記被検出部は、検出レバー側へ突出する突起部からなるので、刺繍枠を枠装着位置に装着した状態で可動部材が検出位置（押圧位置）に切換えられ、検出スイッチの揺動レバーが刺繍枠の突起部に接触し揺動するため、検出スイッチで刺繍枠の被検出部を確実に検出することができる。

【0111】請求項4の刺繍枠移送装置によれば、係合機構は、キャリッジと刺繍枠の連結部の一方に設けられた係合溝と他方に設けられかつ前記係合溝にスライド可能に係合する係合部を有するので、この係合機構を介して係合した前記連結部を前記受け部にロック部材で押圧することができる。しかも、刺繍枠の連結部をキャリッジとロック部材の間においてスライドさせることができるため、刺繍枠の着脱の際、ロック部材を大きく解除位置に退避させる必要がなく、全体的な構造を小型化及び簡単化できる。

【0112】請求項5の刺繍枠移送装置によれば、キャリッジに複数の検出スイッチを刺繍枠装着方向に並べて設け、刺繍枠の連結部に1又は複数の検出スイッチに対応する1又は複数の被検出部を設け、この1又は複数の被検出部を刺繍枠の種類毎に固有の配置パターンで配置したので、キャリッジに装着した刺繍枠の種類を検出できるようになる。しかも、刺繍枠を前記係合機構を介してスライドさせながら装着する際に、検出スイッチが刺繍枠の被検出部に殆ど接触しないように構成することができる。

【0113】請求項6の刺繍枠移送装置によれば、使用頻度の高い刺繍枠に、刺繍枠装着時の進入の際に上流側に位置する検出スイッチに対応する1つの被検出部を設けたので、使用頻度の高い刺繍枠をキャリッジに着脱する際、刺繍枠装着時の進入の際に上流側に位置する検出スイッチ以外の残りの検出スイッチが、前記被検出部に全く接触しないようになるため、前記残りの検出スイッチの検出スイッチの劣化をより確実に防止して耐久性を向上させることができる。

【0114】請求項7の刺繍枠移送装置によれば、可動部材に設けられた突出部と、刺繍枠に設けられ突出部が係脱可能な凹溝とを有し、突出部が凹溝に係合して刺繍枠を前記枠装着位置に位置決めする位置決め機構を設けたので、検出スイッチで被検出部を確実に検出する為に、突出部を凹溝に係合させて刺繍枠を枠装着位置に位置決めした状態で、可動部材を検出位置（押圧位置）に切換えることができる。

【0115】請求項8の刺繍枠移送装置によれば、係合機構を介して刺繍枠をキャリッジの枠装着位置に装着す

る際に、可動部材を案内して退避位置又は解除位置に切換えるガイド部を、刺繍枠の連結部又は可動部材に設けたので、刺繍枠が枠装着位置以外に位置する状態において、刺繍枠を着脱する際、可動部材を退避位置又は解除位置に確実に保持することができる。

【0116】請求項9の刺繍枠移送装置によれば、可動部材に複数の検出スイッチを電氣的に接続する基板を設けたので、複数の検出スイッチに対応する複数の配線を、可動部材に設けた基板を介して纏めて刺繍枠移送装置の制御装置等に接続できる。

【0117】請求項10の刺繍枠移送装置によれば、刺繍枠移送装置の制御装置に基板の配線を電氣的に接続するコネクタを前記基板に設けたので、基板の配線の刺繍枠移送装置の制御装置への接続と分離を容易に行うことができ、刺繍枠移送装置の組立てやメンテナンス等のときに便利になる。

【図面の簡単な説明】

【図1】本発明の実施形態に係るマシンと刺繍枠移送装置の斜視図である。

【図2】刺繍枠移送装置の平面図である。

【図3】刺繍枠移送装置の底面図である。

【図4】刺繍枠移送装置の正面図である。

【図5】刺繍枠移送装置の背面図である。

【図6】刺繍枠移送装置の左側面図である。

【図7】刺繍枠移送装置の右側面図である。

【図8】刺繍枠移送装置の移送機構の平面図である。

【図9】キャリッジと刺繍枠の一部の平面図である。

【図10】キャリッジと刺繍枠の一部の平面図である。

【図11】キャリッジの刺繍枠の一部の平面図である。

【図12】刺繍枠移送装置の要部の正面側からの縦断面図である。

【図13】キャリッジの平面図である。

【図14】キャリッジの右側面図である。

【図15】キャリッジを含む要部の正面側からの縦断面図である。

【図16】キャリッジを含む要部の正面側からの縦断面図である。

図である。

【図17】移送機構の右側面図である。

【図18】移送機構の左側面図である。

【図19】移送機構の正面図である。

【図20】調節機構を含む要部の立て断面図である。

【図21】調節機構を含む要部の立て断面図である。

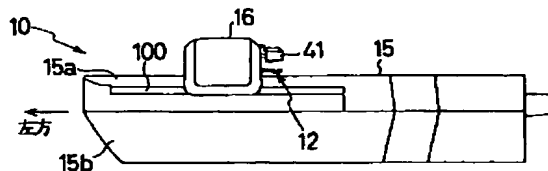
【図22】第2の調節機構を含む要部の立て断面図である。

【図23】第2の調節機構を含む要部の立て断面図である。

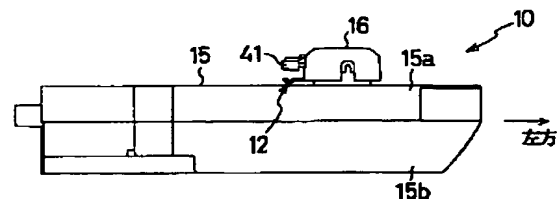
【符号の説明】

M	マシン
10	刺繍枠移送装置
11	刺繍枠
12	キャリッジ
13	Y方向移送機構
14	X方向移送機構
15	ケース
16	可動ケース
23	被検出部
30	係合機構
40	ロック機構
41	ロック部材
42	圧縮コイルバネ
45, 46	第1, 第2ガイド軸
47, 48	案内孔
50	位置決め機構
56	検出スイッチ
57	基板
58	コネクタ
60	Y方向フレーム
70	Y方向駆動系
80	X方向フレーム
90	X方向駆動系
110	調節機構
115	第2の調節機構

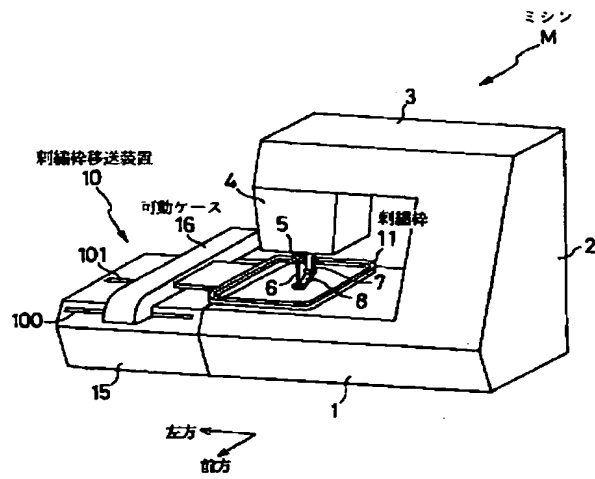
【図4】



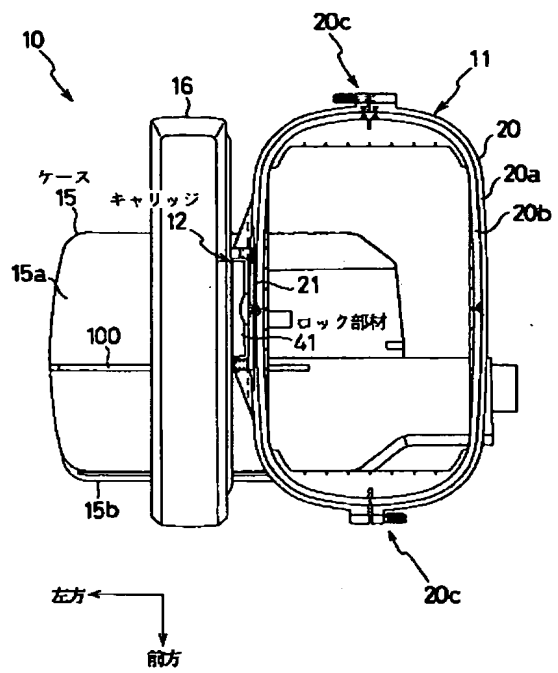
【図5】



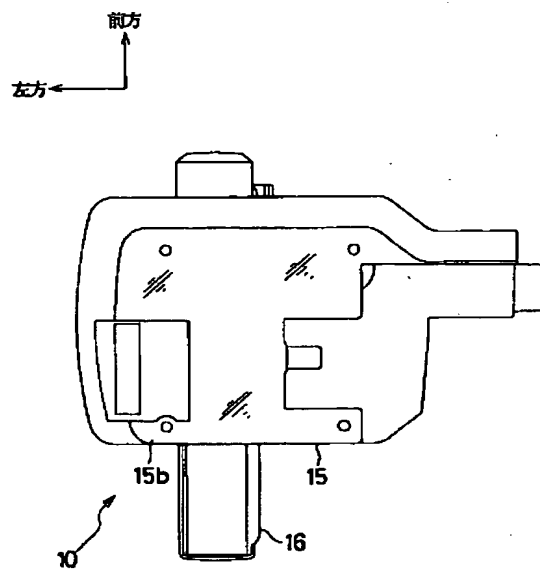
【図1】



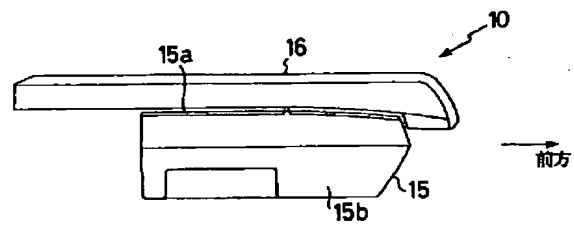
【図2】



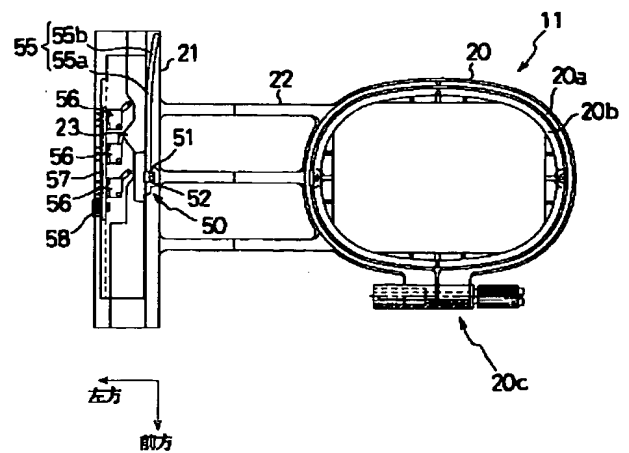
【図3】



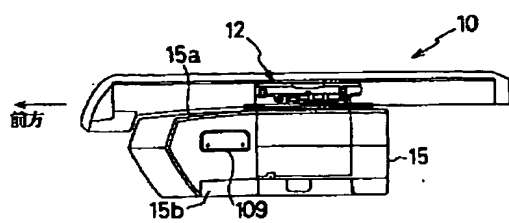
【図6】



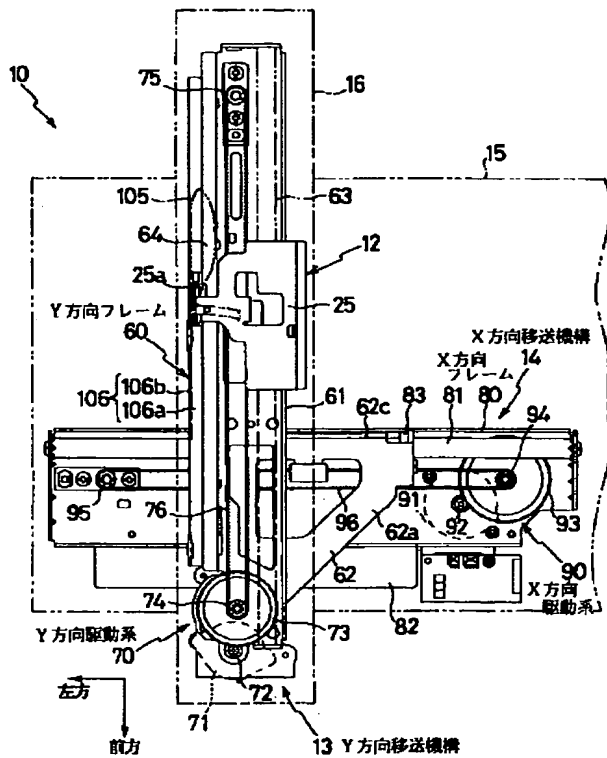
【図11】



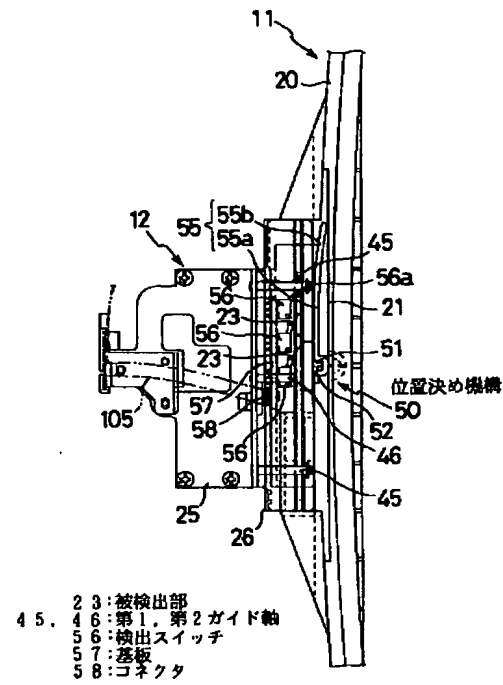
【図7】



【図8】

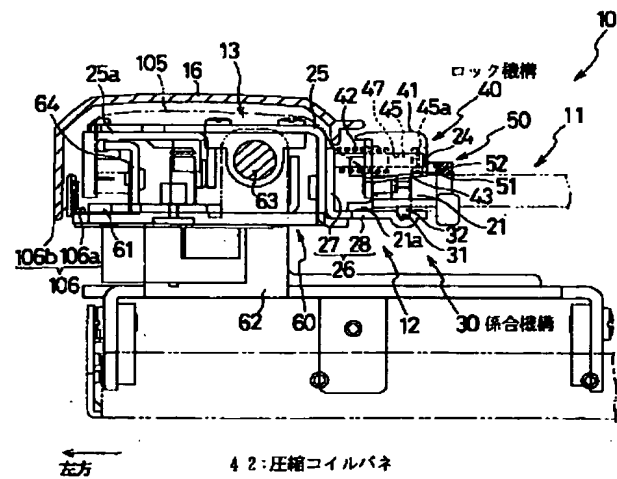
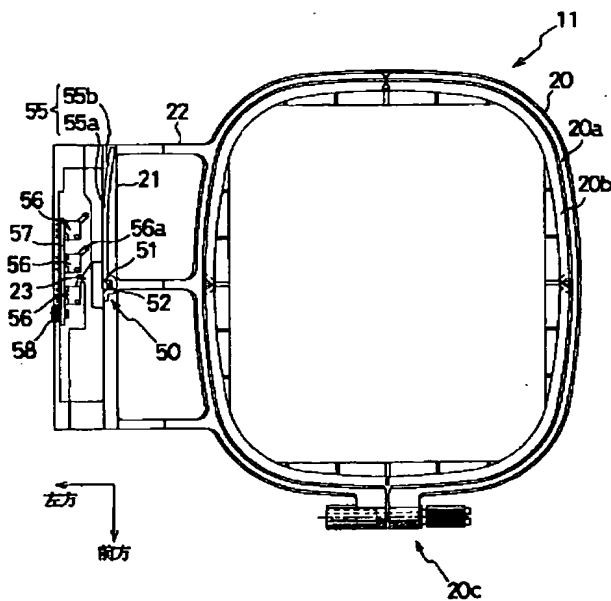


【図9】

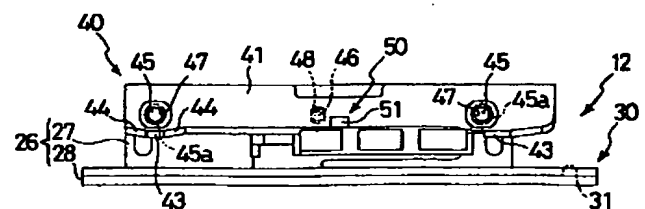


【図12】

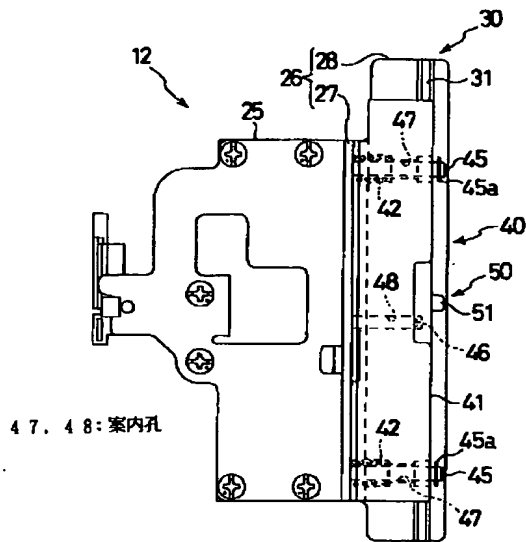
【図10】



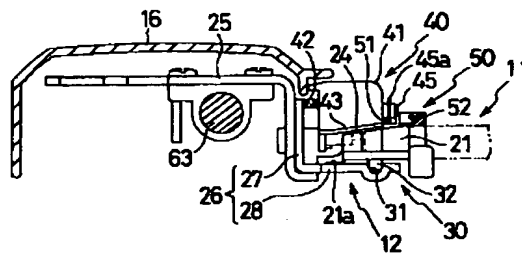
【図14】



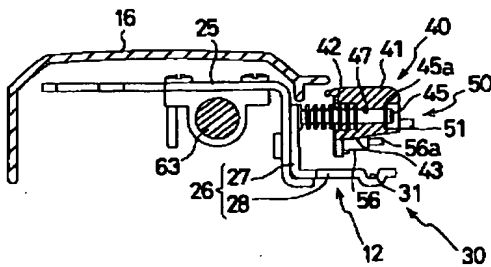
【図13】



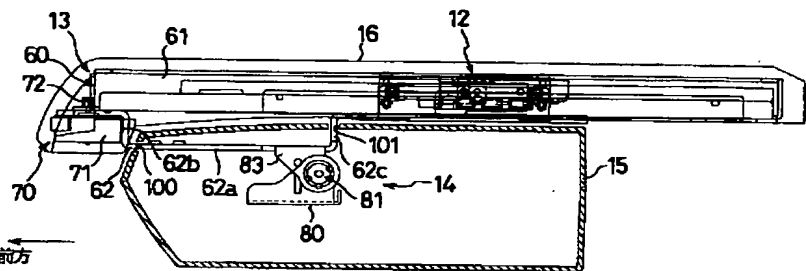
【図15】



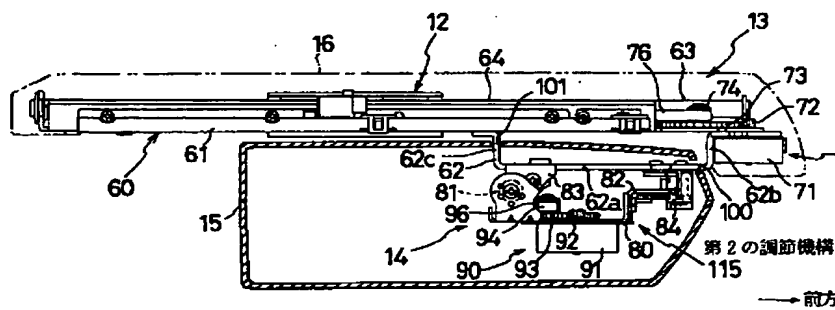
【図16】



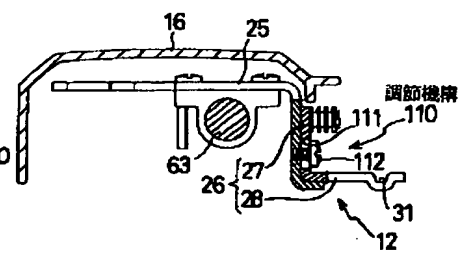
【図17】



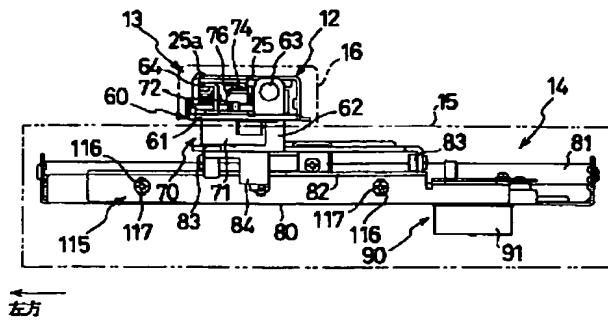
【図18】



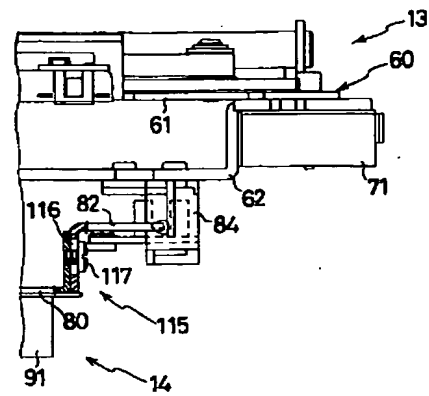
【図20】



【図19】



【図22】



【図23】

